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Motor Mining

The Commercial Vehicle

Volume XVI
Number 1

FEBRUARY 1, 1917

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NEW YORK Dec., 30, 1916. 191

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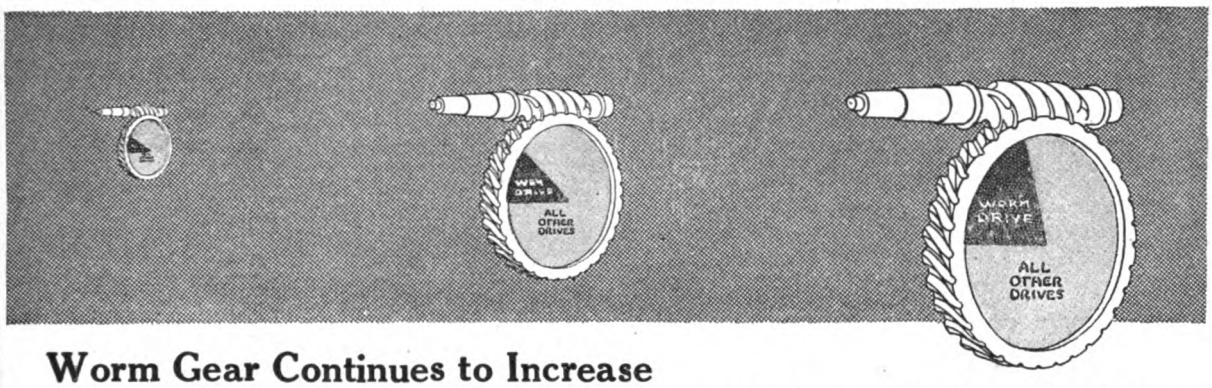
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1913 1914 1915



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¶ It should be noted that this is a percentage of models produced—rather than trucks actually produced—the only fair way to estimate, as the other method, that of actual number of trucks produced, will show an even larger percentage in favor of worm gear.

SHELDON

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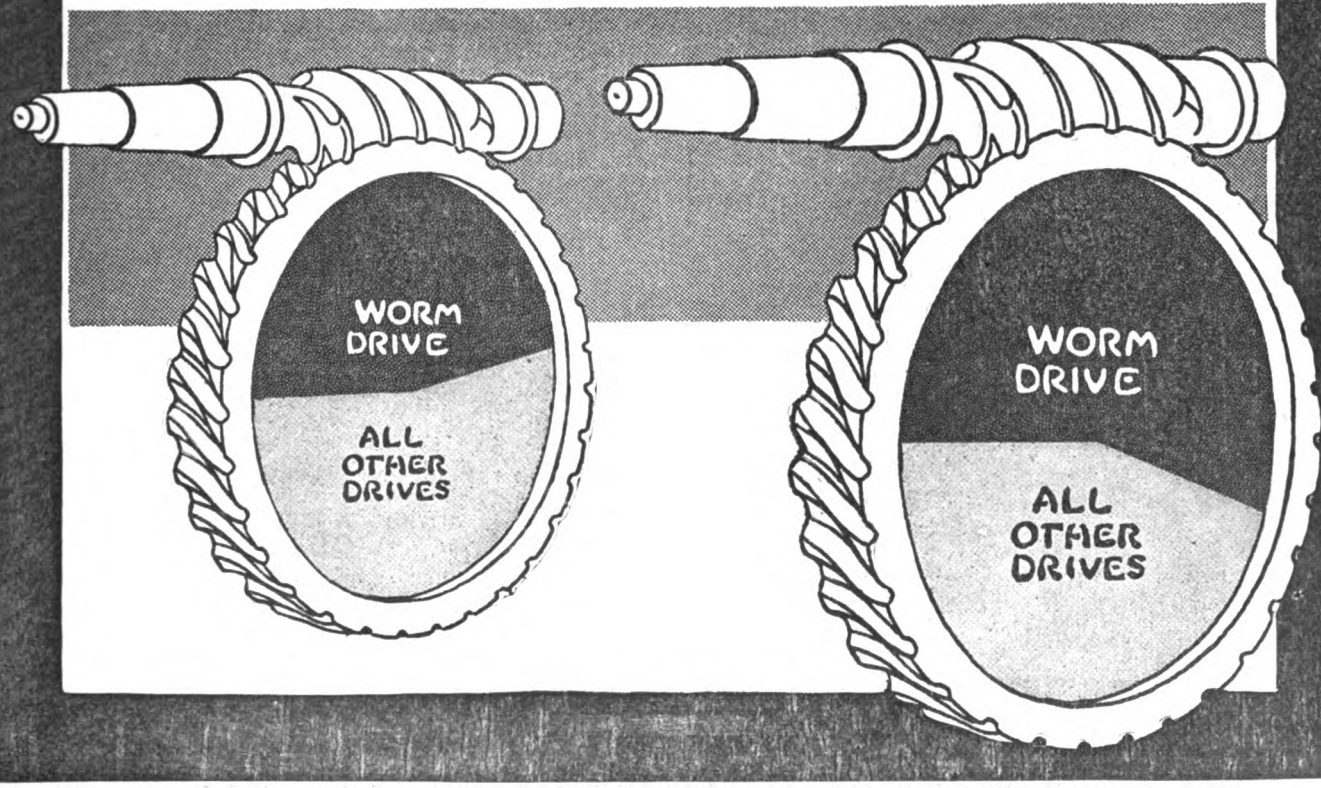
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The COMMERCIAL VEHICLE
Read by Business Men

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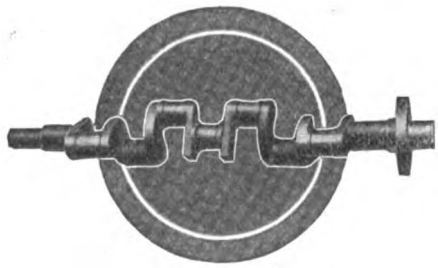
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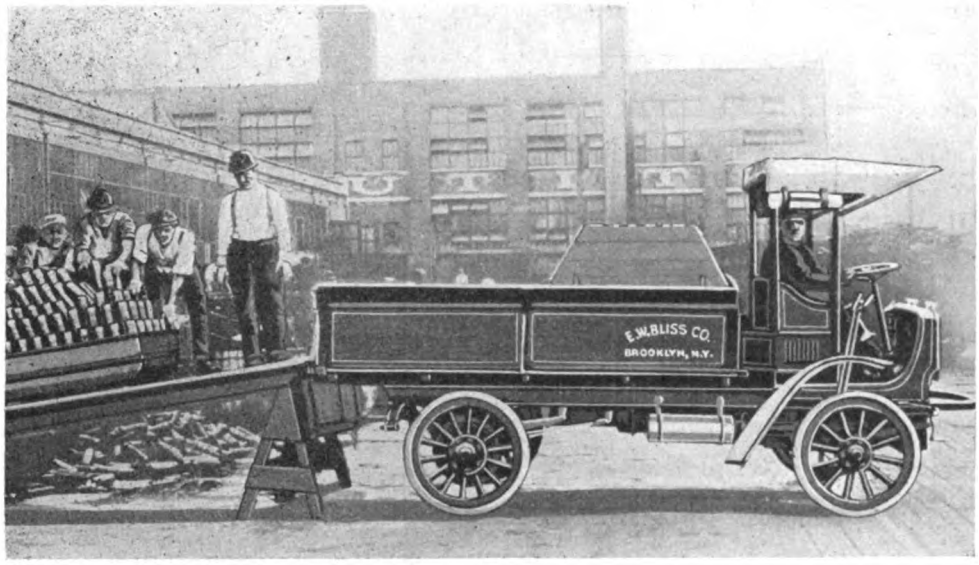
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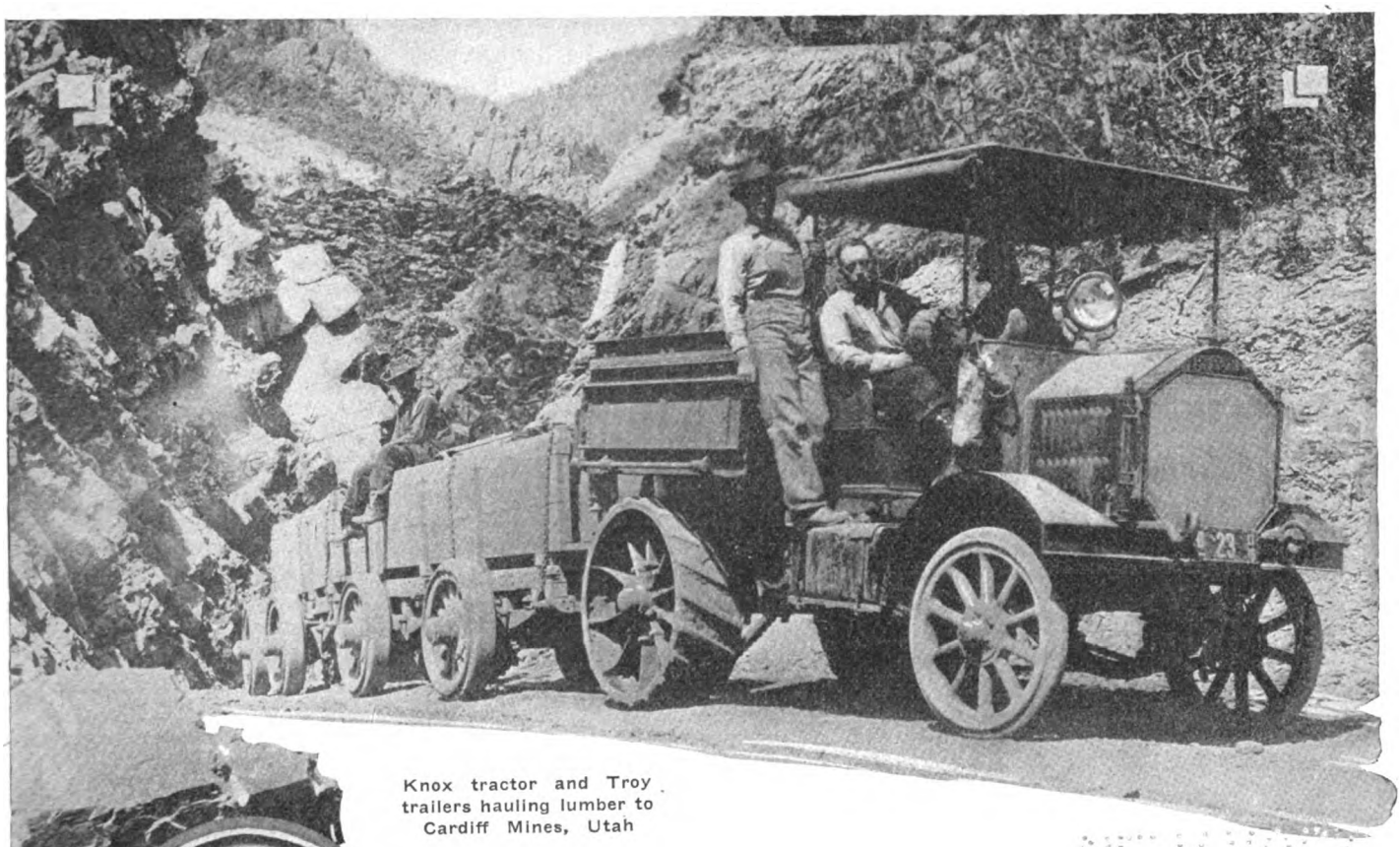
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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI February 1, 1917 No. 1



Knox tractor and Troy trailers hauling lumber to Cardiff Mines, Utah

Motors Trail Prospectors' Burros

By Willard L. Morrison

STIMULATED interest in mining, due to the war bringing about high metal prices, has caused the reopening of many mines heretofore inactive.

Closely associated with this activity comes also renewed interest in the modern transportation methods. After the prospectors' patient burro follow the motor truck and tractor.

Many mines contain ore in large quantities of sufficient grade to return big dividends, providing the cost of transportation to the smelter is not too great.

Transportation is the one great big question in mining. Efficient smelting methods permit even the lowest grade ore to be refined profitably if it can be bought at anywhere near the mined price. The great difficulty is that in many cases the vein or deposit is located so remotely from railroads or other means of transportation that the establishment of smelters or refining plants at the mines is impossible owing to the cost of transporting coal and other supplies to it, and transportation from these wilderness mines to refining plants located on the railroads raises the cost of the crude ore beyond where it is profitable to extract the metal. That is, such has been and still is the case in many instances; but progressive mining interests are learning the effectiveness of motor transportation as a means of getting the ore down economically.

Experience has taught investors that low-grade propositions are the biggest and surest. Many high-

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grade fissures have been opened in the past that were of such quality that they could stand the cost of hauling by oxen, even as great a distance as 100 miles. But in most cases the high-grade ore soon ran out, and the larger bodies of low-grade ore had to be abandoned until sufficient money had been expended in prospecting and blocking out ore enough to warrant the construction of railroads.

The motor truck and many other devices, such as gasoline and steam tractors and caterpillars have been experimented with, some of which have been successful and others have failed to operate at the low cost necessary for a low-grade mining proposition.

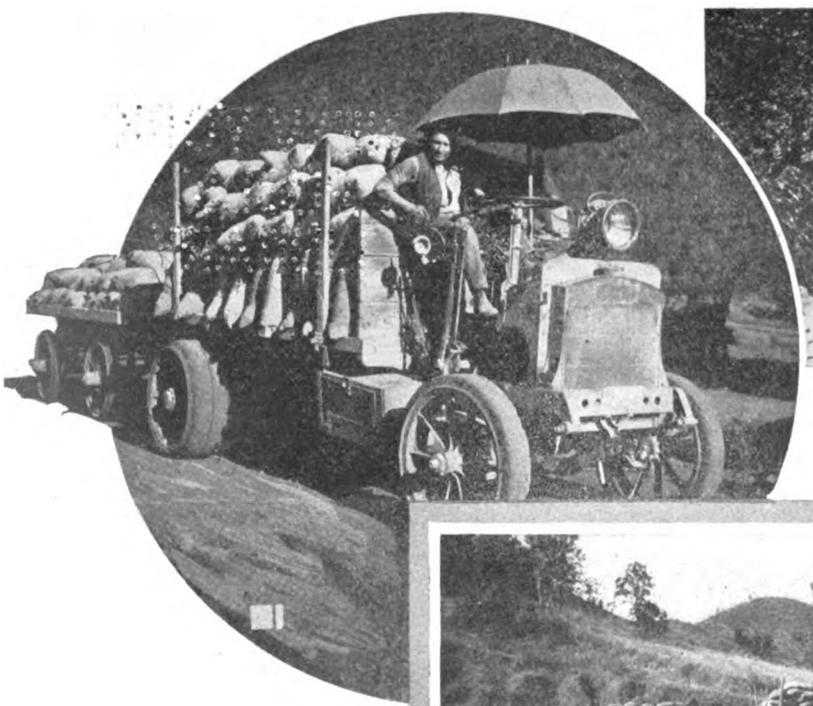
The writer is at present operating a tractor over a 16-mile haul to the railroad, which includes a climb over the Continental Divide. The mine is 2600 ft. above the railroad dumping platform. Twice the road descends to the 5500 ft. level, only to rise again, and finally to the top of the Divide 7300 ft., to the 3-mile drop to the railroad level of 5100 ft. Many enthusiasts have motored from different mining regions to watch the operation, and a great many questions have been asked; a surprisingly large number of which were plied by parties that were contemplating a similar expedition.

My outfit, operated under the name, Boston & Montana Development Co., is a White 5-ton Good Roads model truck, and despite the severe grades I am able to use trailers. As may be seen in the illustrations of the outfit on page 7, the vehicle has very wide steel tires in the rear. These prevent the truck from sinking into the soft alkali dust and actually improve a road from having run over it.

The question of how many trailers can be used depends chiefly on road conditions. As many as 15 tons can be hauled by using two trailers on a good hard road, even up a 10 per cent grade. This would not be



To the right, tractor-train climbing trestle to dump. Below, a California outfit—that of C. H. Congdon, Jr., with 7½ tons of calcined magnesite

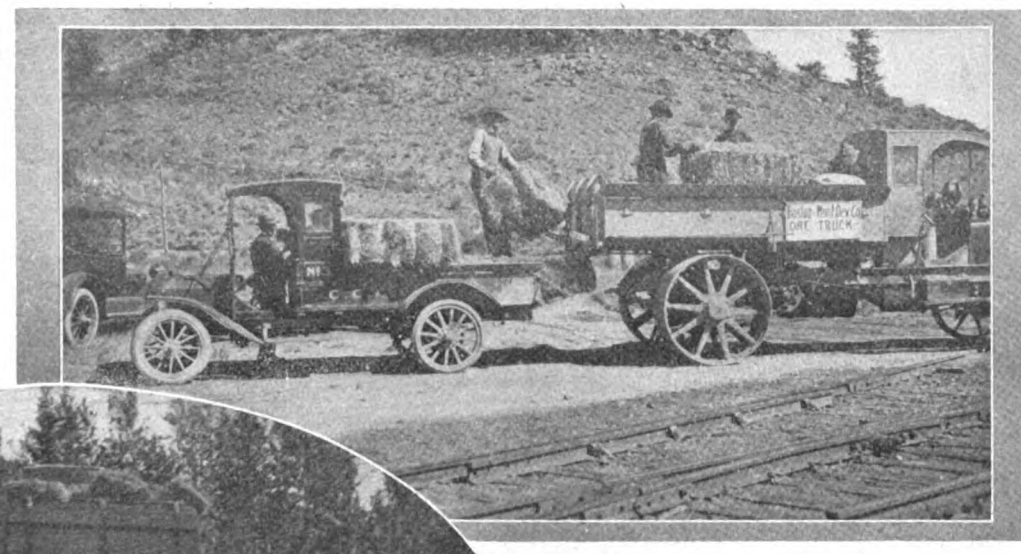




Above, where the hydraulic brakes on the tractor are needed—holding back the train on a pitch. Below, one of Congdon's trucks with an overload followed by one with a trailer—which is best?

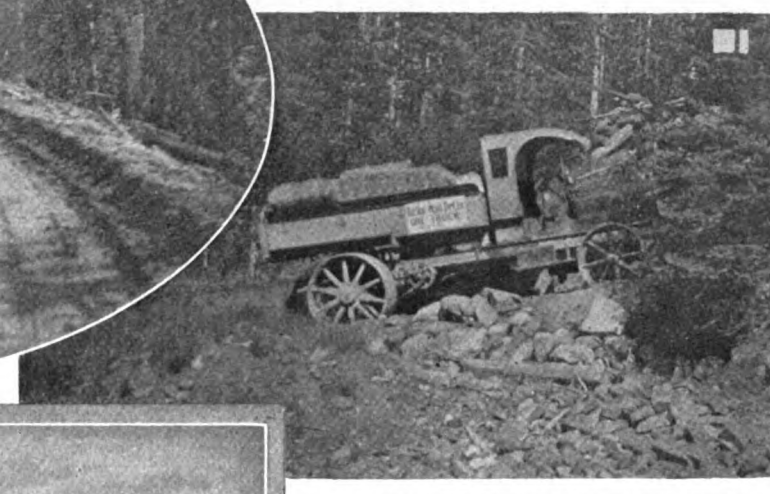


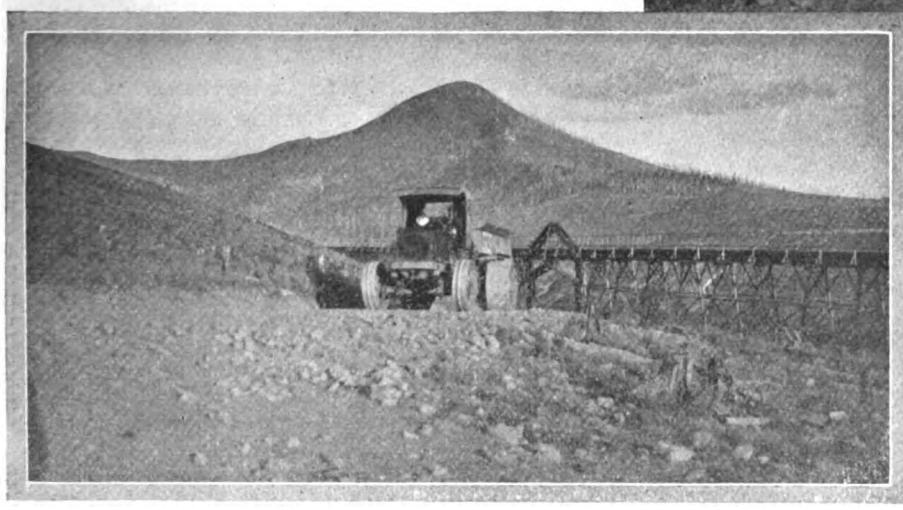
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To the right, loading supplies at the railroad, formerly hauled by horses at a cost of 75 cents per hundredweight. Below, how the wide tires support the 15-ton vehicle in soft mud







Above, climbing a 16-per cent grade with 2 tons of mine supplies. To the left, hauling 8 tons up a 10-per cent grade on a 100-in-the-shade August afternoon

possible if the road were in a muddy condition.

This brings to mind the point which carries the whole project to success or failure. The machine being geared 84 to 1 on low gear, and the power being a six-cylinder 68-horsepower engine, it is easily able, when the necessary traction is absent, of spinning the power wheels, even though chains or cleats are attached.

This never happens on a well-graded road, but it is sure to happen on a soft loam road that is not properly ditched, and with necessary culverts to care for excess water.

The above is a very important factor in procuring low costs per ton-mile for a season's work, for if 5 or 6 weeks of idleness during the rainy season must be charged up against the total sum of activities during good weather, it reduces the chances of operating at a low enough figure for mining purposes, by a large per cent.

By using chains or spikes on the drive wheels and reducing the load to 4 or 5 tons, it is possible to operate, but it would mean the ruination of the road in a short time.

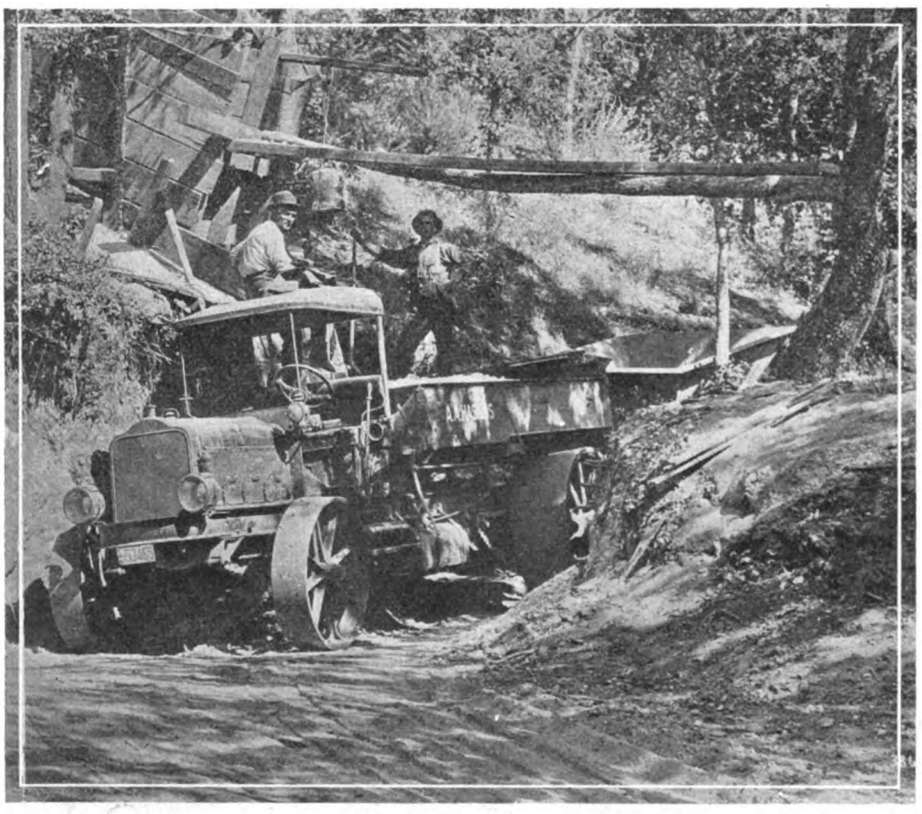
Pictures by various motor truck companies show their product pulling loads out of seemingly impossible mudholes. While those stunts are possible, they would not pay for a commercial hauling proposition.

One stunt that has caused much comment from a traction standpoint is the ability of the tractor shown in the illustrations to dump a load of 4½ cu. yd. of loose gravel, which forms a pile some 4 or 5 ft. high, and then plow right through the pile on the return trip to the gravel pit.

Another question frequently asked was: "How much gasoline is used per mile?" The average mileage for the year for the 16-mile haul, including the many hills and pulling from 8 to 15 tons was 1½ miles per gallon, oil 30 miles per gallon.

To secure the utmost out of the money invested, the machine was operated three 8-hour shifts; the running time for 16 miles and return being 6 hours, leaving 2

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A. A. Haskins is the biggest miner of dolomite in the world. This is the chute by which the precious mineral is loaded into the truck and trailer—Note the awkward pit out of which it must pull itself and its trailer

hours each trip for time consumed in loading, dumping and greasing the tractor.

Rubber-tired wheels are not a necessity for this class of hauling; for the speed waranted for such large loads, for safety, should not exceed 6 to 8 miles per hour.

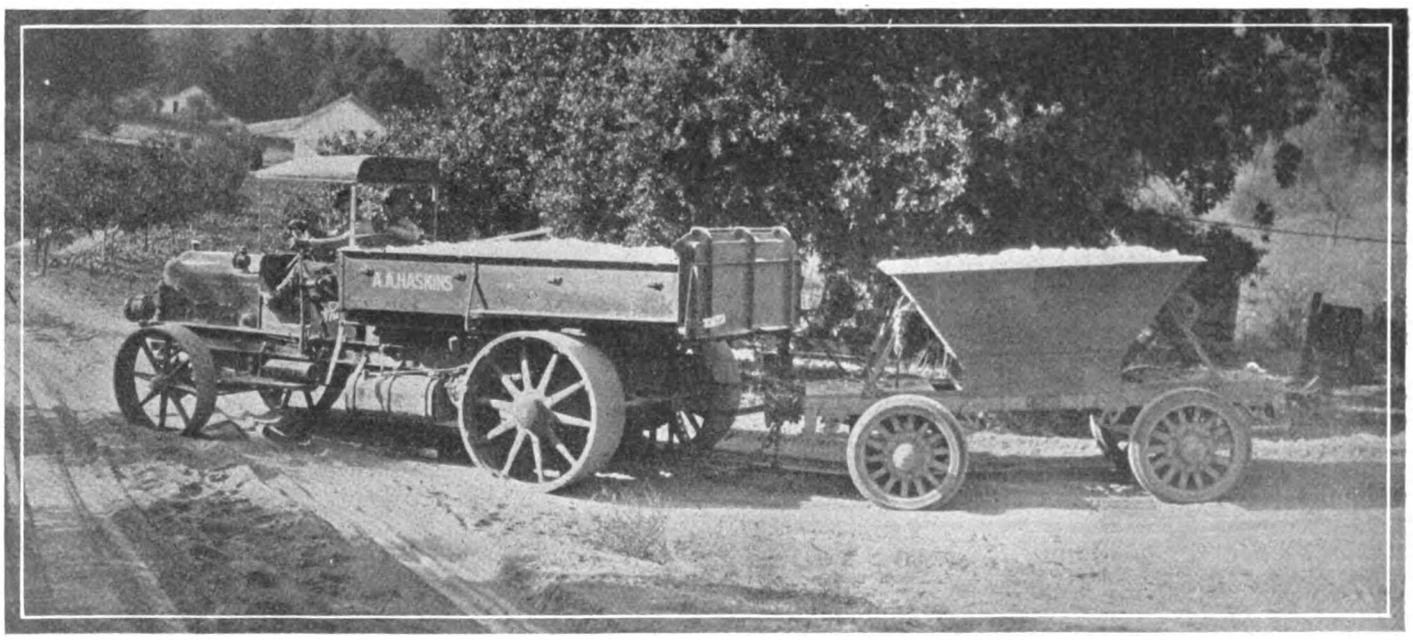
REQUIREMENTS differ, in ore hauling, according to conditions. In some cases the motor truck, carrying a load itself and not hauling trailers serves best, owing to extraordinarily difficult road conditions. In some cases the four-wheel-driven type has succeeded where others have failed. In other cases, track-laying tractors of the caterpillar type have proven most effective, owing to their enormous tractive adhesion and their ability to negotiate any sort of road surface. Some of these haul trailers which, like the tractor, have lag-beds instead of wheels. In other applications, the ordinary rubber-tired motor truck of commerce is the most economical and in still others the semi- or full tractor of the commercial type.

An interesting series of experiments with some of these various types of equipment was conducted by the Mines Transportation Co., Salt Lake City, Utah, to evolve a means of transporting ore from the Cardiff mines in the Big Cottonwood district of Utah 16 miles down tortuous trails to the smelters in Salt Lake valley. The down load was ore and the up load coal and supplies for the mines and mining settlement.

The officials of the mine were convinced that trailers were the logical rolling stock, their problem being the selection of the proper sort of hauling power. Accordingly, an order for sixty 5-ton Troys was filed and filled. Then came the test of different forms of tractors.

Hundreds of teams were formerly employed at a great expense to haul the ore from the mines down the canyon. Gasoline trucks were given a thorough trial and this method of transportation was proven unsatisfactory. Track-laying tractors were used weeks in a frantic attempt to handle the tremendous output of the Big Cottonwood mines. All these methods of transportation, however, were found to have their weak spots and the company had about despaired of any satisfactory method short of building a railroad down the canyon.

The crawler tractors were found to be too slow and to consume too much road width, so that two outfits could not pass on the trail, although otherwise they were excellent. The type made by the C. L. Best Company of Oakland, Cal., was employed. The final result of the tests was the selection



Here is the 10-ton train that solved the transportation problem of the A. A. Haskins Dolomite Co.

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of the Knox towing winch tractor, which carries none of the load of the trailers, but has a small body for five tons of load or ballast to secure traction.

The demonstrations were in charge of L. B. Stone and eleven trips were made from the ore bins of the Cardiff mines in Big Cottonwood Canyon to the smelters in Salt Lake Valley. Following is a brief synopsis of results of these eleven demonstrations:

The equipment consisted of one Model 36 Knox tractor with 5-ton ore body and two 5-ton Troy trailers, equipped with regular steering apparatus, roller bearings and 36 by 7-inch rubber front tires.

On the down trips from the mine the trailers were practically always held back by the brakes on the tractor, this being a remarkable performance owing to the fact that in many places the grades are as steep as 16 per cent.

Traffic was never interfered with in any manner, on account of the fact that the tractor could pass as easily as the ordinary motor car.

The tractor was equipped with steel rear wheels 14 inches wide, which were fitted with diagonal cleats. After the eleven trips up and down the canyon, no appreciable wear was noticeable on the tires. Some of the demonstrations were made during heavy rainstorms and no difficulty in negotiating the trip was experienced at any time.

The total tonnage of ore hauled during these eleven demonstrations was 272,660 pounds and although coal was not taken back on every return trip, a total of 27,080 pounds of coal was hauled back from the valley up to the mines. The amount of coal hauled per trip ranged from 3600 to 4300 pounds.

An average fuel consumption of 21 gallons per round trip was registered, it is reported, or better than 1½ miles per gal. and the round trip consumption of oil averaged 2 quarts. Two trips were made every 24 hours, the average time coming down being 3½ hours, which with allowing 1 hour for loading and unloading gave 3 hours for oiling, taking on gas and inspecting the machine.

No repairs of any nature were necessary during the eleven trips. The distance covered on each trip down included 9 miles in the canyon proper and 7 miles across the valley, which included one very steep hill.

One of the most remarkable features of the demonstration was the fact that at no time during the demonstrations was it necessary to add water to the radiator on account of heating. The radiator showed signs of boiling at no stage of the demonstration. Considering that a rise of 3050 feet is negotiated in this trip of 16 miles, 7 of which are across the valley, the fact that the radiator did not overheat is even more remarkable. The difference in altitude seemed to make no difference whatever in the power of the engine.

Ezra Thompson, President of the Mining Company, said:

> "It is true that almost every sort of transportation method has been attempted to bring the ore down from the Cardiff mines and many companies have expressed the utmost faith in their particular method of handling the ore. One of the features that particularly impressed me in the Knox tractor demonstration was the fact that the machine is under the control of the driver on even the steepest grades. I have seen the driver bring the tractor, hauling 18 tons of ore, to a complete stop within 10 feet on the steepest grades in the canyon."

The United States Transportation Co. now has the contract for hauling ore from the Cardiff mines to the smelters. The records show an average of 20 tons of ore per tractor each trip and the company states that the schedule of the trips does not vary 7 minutes.

STRIKINGLY illustrating the economy of motor transportation over horse haulage in this rough-and-ready work of mine transportation, the installation of the A. A. Haskins Dolomite Co., San Francisco, Cal., represents a typical instance in which a special type of truck and standard trailers have been found most effective. The Haskins Company owns the largest mine of pure dolomite* in the United States, aggregating over 3,000,000 tons. It is using a White Good Roads truck and a 5-ton Troy trailer to haul 40 tons of dolomite every 24 hours from the mine to the nearest railroad siding a distance of 10½ miles.

The road from the mine to the railroad is one of the worst roads for hauling to be found in any part of the country. It is full of chuck holes and 8 miles of every crooked mountain road is covered with a fine dust 6 to 8 inches deep. There are steep, sharp turns with grades from 8 to 10 per cent and 1½ miles long, making the task of hauling a very difficult one.

Before purchasing the truck and trailer the company experimented with mules and horses for hauling. One animal could deliver to the railroad 1 ton of dolomite every 24 hours. In order to deliver a minimum amount of 40 tons to fill a freight car, it was necessary to use five teams of eight horses each, necessitating five drivers and the regular stable help. The cost of this method was prohibitive and was soon abandoned. A rubber-tired truck was then purchased, but the roads were so rough that the trucks could not operate efficiently.

With Eastern steel and paper mills, builders' supply companies, plaster and chinaware concerns wiring for long term contracts and quantity shipments of this pure dolomite, the company was at a loss to solve the problem of getting the mineral to the railroad until they purchased the present outfit. Now it can satisfactorily meet the market demands, the new equipment being able to make four trips in 24 hours from the mine to the railroad and deliver 40 tons of material. The drivers are not permitted to drive the truck over 5 miles an hour, tonnage and dependability being more essential than speed.

The cost of delivering 40 tons of dolomite with the truck and trailer is figured at $28.71, while with horses and wagons the same tonnage incurred an expense of $58.21, resulting in a net daily saving to the owners of $29.50. The truck paid for itself in the first 7 months in service, out of savings over horse haulage.

There are two shifts of drivers and the truck uses 44 gallons of gasoline and 4 gallons of oil to haul 40 tons, registering a total mileage of 84 miles. In the day-time 12 gallons of gasoline are consumed and at night 10 gallons for the round trip. The summer days are extremely hot and the nights cool.

The mine is located in San Benito County and the truck and trailer are loaded direct from a chute into which the dolomite is dropped. Three minutes' time is required for this operation. To reach the chute there is a grade of 10 per cent with 12 inches of dust covering the road. The truck pulls the trailer up this grade and a sharp turn with a 40 per cent curve is negotiated in order to get under the chute. A steep drop from the chute necessitates low gear work to get onto the road.

There are no brakes on the trailer and thus the responsibility of holding the 10 tons load on any part of the grades between the mine and the railroad falls on the truck. A short distance from the railroad the road leads for ¼ mile across the deep sand and gravel bed of the Salinas river, which is always dry in the summer. The road-bed was packed with straw in order to give the truck better traction.

STANDARD trucks also find a useful field in mine hauling. C. H. Congdon, Jr., is a hauling contractor, of Oakland, Cal., which, as nearly everyone knows, is just opposite San Francisco on the eastern side of the bay. He has a contract to haul calcined magnesite from a mine in Santa Clara County, Cal., to Livermore, Cal.

For this service he uses two 5-ton Locomobile trucks and a 2½-ton reversible Troy trailer. Both trailer and trucks are equipped with rubber tires. The haul is over ordinary country roads, which are in fair condition save that some severe grades and in the long dry season considerable dust are encountered.

The haul is 32 miles in length and the material is carried in sacked form, 5 tons on each truck and 5165 lbs. on the trailer.

*Steel mills making steel by the open hearth process, use dolomite as a flux. It is also calcined to make lime and plaster. The gas, a by-product, is used for charging soda water and other carbonated drinks. The residue after being hydrated makes an everlasting lime for making plaster ornaments, stucco work, etc.

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A Postal Motor Reserve—Why Not?

CORPORATIONS have one great advantage over the government—they are better organized, and their organizations are more flexible. The government of the United States of America has two great departments which have need for a great deal of motor transportation; the post office, which needs it all the time and the army, which needs it very badly once in a while.

Recently the army had a big job to do in our next-door neighbor's yard, and in order to do it found that trucks were indispensable. Always sufficient unto itself and never prepared, the army was forced to frantically buy trucks from anywhere they could be obtained. In order to get them fast enough, Congress had to pass a special law requiring that factories shall disregard their contracts and promises to more provident governmental customers, in time of peace, and concentrate on government requirements.

So the army bought some 2300 new motor trucks. Next, there had to be drivers and so, helplessly unprepared as before, the War Department called upon the motor truck industry to make good this further deficiency, so that a little army of nondescripts was collected on the border to drive Uncle Sam's trucks for their board and keep and $100 a month clear. They were civilians and under no military authority. They were not examined and many of them had practically never handled a motor truck before. Certainly none of them had any idea of the requirements of military service or training for military life.

MEANTIME the Post Office Department was also learning things about motor trucks. Formerly transfer work between post offices and railway stations and later parcel post collection and delivery had been handled on the contract system because no previous postal administration had felt equal to the task of organizing efficient transportation installations in the various cities.

Until recently the requirements for postal transfer vehicles were not very specific, and whether the contractor used horses or motor trucks was usually a matter of his own option. Some of these contractors found that they could do the work more cheaply with motors than with horses and the government awoke to the fact that in doing it more cheaply they were also doing it infinitely better; that the service was actually more reliable and much swifter; connections were closer and the whole operation of dispatching and receiving mail was accelerated. So the Post Office Department began to specify motor vehicles in proposals for contract bids.

A few experiences with terminated contracts which were not renewed by the former holders and for which there were no bids from truck users convinced the department that the danger of having to go back to horse transportation was too great under the contract system and so experiments have been conducted in eight large cities, in which the government has taken over the postal work at the expiration of the contracts and bought trucks of its own. Unquestionably, if the matter is handled properly at all, the service will be extended to cities all over the country and the number of trucks required will mount into the thousands.

WHILE the post office has been endeavoring to find ways and means of securing this great fleet of trucks, the U. S. Army has built the largest garage on the Western hemisphere at Fort Sam Houston, Tex., in which to store some thousand-odd trucks for which it has no further use. Other similar garages are being constructed at Fort Bliss and Brownsville, in which most of the balance will be put. Probably a few will be sent to various army posts and a few may even be loaned to the various National Guard organizations. The bulk of Uncle Sam's new fleet of trucks, however, will go into dead storage, there to collect dust and rust and to constitute a heavy liability.

If this government were a corporation, instead of hiring postal haulage by contract and employing only sufficient trucks in the army to do the post and arsenal work, the government would have had vast fleets of highly-profitable trucks in the post office service, manned with drivers selected under the public service regulations, trained in government work and possibly subject to military duty, if required.

Thus the army would have no heavy, non-earning investment in idle trucks, and yet would have a fleet of vehicles in good condition and manned by capable operatives, ready for service at a day's notice.

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There is yet time. Let the post office cease to buy new chassis when the government already has an equipment of more trucks than it knows how to use. Let it install these Mexican war trucks in the postal service. Leave the olive-drab paint on them. Leave their military bodies on, devising a detachable screen section to fit on in place of the bows and man them with young men of good character who will be assured steady jobs at good pay in return for a little instruction in convoy formation, rudimentary military drill, camp life, the care and operation of a rifle, and their promise to respond to a call for military service on their usual trucks in case they are drafted by the army.

This is the best first step toward adequate transport preparedness to be taken. Similar organization of rural delivery carriers in their light cars or motorcycles is a further possibility. There has been a lamentable lack of attention to this important matter of transport preparedness, even on the part of those societies which profess to be devoted to efficient preparedness for defense. Everyone who has observed military developments in the past 2 years at all must concede that nothing can be more important in a military way than readiness and ability to place tactical units in strategic positions quickly. Germany's great coup was her ability to get in the first blows so quickly that before the ponderous machinery of her allies had been set in motion she had definitely and, it seems, permanently established the battle fronts on her enemies' territory.

Empire State Solons Deaf to Arguments Against Truck Tax

Users Demand Adequate Hearing ere Bill Becomes Law

ALBANY, N. Y., Jan. 24—With almost unheard of precipitancy the assembly and senate committees on the Hewitt bill, which places a severe and indefensible tax on motor trucks, omnibuses, taxicabs and rented cars, early this evening reported it favorably out of committee after sitting but 15 minutes and immediately after a hearing lasting 3 hours and taking place on the almost unheard of notice of 21 hours. In spite of the shortness of time, however, the measure was deemed so drastic and so far-reaching in its effects that a delegation from eleven associations, nine large users and three manufactures and representatives of the private car renting interests and the taxicab companies appeared before the legislative committee and literally tore the measure to shreds.

From the scholarly dissection of the legal aspect of the measure by Charles Thaddeus Terry, counsel for the National Automobile Chamber of Commerce and The American Automobile Assn., The Automobile Trade Assn. of New York State and The Automobile Dealers Assn. of New York State to the appeal of L. R. Gwyn of the American Express Co., the largest individual user of motor trucks in the state, in which he showed that the measure meant an increase of $15,000 a year or 600 per cent in the license cost of this installation alone, the objections left no room for defense of the measure. Despite the clear demonstration by legal counsel that a bill to ratify the acts of an irregular and illegally-constituted commission was wholly improper and illegitimate; despite the obvious unfairness of charging motor trucks a greater fee than passenger cars when the former almost never use the state or state-aided highways while horse vehicles pay no tax whatever; despite the word of the Secretary of State that there was no need of hurry; despite the admission by Senator Brown that the comparative tax on trucks and cars was inequitable; despite the admitted fact that the $600,000 to be raised by the tax will come largely from New York City business concerns whose trucks never use state or county highways and that it will go to the general state fund and will not be used in any way for the improvement of roads used by the payers of the tax; and despite the clear demonstration of the fact that the commission had utterly failed of its duty as prescribed by the last legislature creating it, practically with one voice the legislative committee insisted that the roads were costing the state $15,000,000 a year, that the legislature had to raise funds and did not have time to examine closely enough into the matter to make the basis entirely fair or scientific.

The delegation went to Albany with the prime intention of asking for an adequate hearing, as this was the first hearing of any kind which had been granted since the commission made known its recommendations, and owing to the shortness of notice it was deemed entirely inadequate. From the first, however, it was apparent to those who watched and listened to the legislators that nothing that could be said would have any effect. The bill has yet to be passed by the Senate and Assembly and is to be approved by the Governor, but all indications point to this being done with the utmost haste unless a vigorous protest is made immediately by all business concerns and manufacturers throughout the state using motor trucks.

The bill, if passed, will ratify the schedule of fees proposed by the Motor Truck Registration Fee Commission, and will be introduced as Assembly Bill 123 and Senate Bill 73. The commission, comprising Highway Commissioner Duffey, State Engineer Williams and Superintendent of Public Works General Wotherspoon, was formed by the last legislature charged with the duty of formulating a schedule of so-called registration fees based on "The time and extent of use of the public highways and the relative wear and tear of the public highways by reason of such use."* An appropriation of $5,000 was made to cover the expenses of the investigation. A Mr. Wagner, a highway engineer, was employed to make an investigation and the commission states that it secured data from other states, from cities and from foreign countries on the matter before reaching its decision.

The commission was asked on several occasions for an opportunity to discuss the question with truck users and manufacturers. On one occasion Commissioner Duffey edified the Motor Truck Club with a talk on scenic and through tourist roads in New York State, pointing out what their cost was and intimating that the tax on trucks would be of great assistance in furthering this work. It is doubtful if the humor of the situation has yet struck the commissioner. When asked for details concerning the recommendations to be made, the gentleman stated that none were available, that he was not empowered to speak for the other members of the commission and that in fact the body had not yet made up its mind.

Those in attendance nevertheless plied him with questions and submitted volumes of practical information showing that motor trucks did not injure the roads more than other types of traffic or as much as narrow steel-tired horse wagons; that they did not use the public highways, etc., etc., but the policy of secrecy was adhered to. Two other conferences—they cannot properly be termed hearings, since they were held in ignorance of the intentions of the commission—one in Albany and the other in the rooms of the Merchants' Assn. of Greater New York in the Woolworth building, resulted only in the presentation of more data of an intensely practical nature and its sphinx-like reception by the mysterious body of commissioners.

*From Chapter 598 of the Laws of New York State, 1916.

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At all meetings the commission refused to show its hand, and Commissioner Duffey to-day, in spite of the lengthy and thorough discussion of the merits of the whole question in as far as possible without knowledge of the body's intent, had the audacity to assert that at none of these meetings was anything constructive proposed, but that instead it was only urged that the previous $5 fee be retained. Despite the inadequacy of blind meetings in lieu of hearings of the customary sort, Senator Brown, who seems to be the moving spirit in the movement, insisted that no further hearings were needed. The genial bellwether having thus expressed himself, further hearings before the committee were denied.

When the commission finally made its report, truck users who had followed the trend of events were dumbfounded. The commission after all of its alleged scientific investigation had only drafted the crudest sort of rule of thumb. The legislature had made the mistake of giving the commission an impossible task—a result to be achieved which could only be very roughly approximated even after years of careful study of all factors involved by highly scientific expert investigation.

Although it had been clearly shown that the basis for wear and tear must be the relative pressure per inch width of the tire on the road, the commission arbitrarily chose total weight as the determining factor, not only a wholly inaccurate basis, an unfair discrimination against users of large trucks, but a rating, which if adopted will have a fearful effect on operating efficiency through the encouragement of overloading of small trucks in order to save license expense.

Instead of accepting the reasonable alternative of either studying the question deeply enough and in a sufficiently fair-minded manner to arrive at at least a quasi-scientific schedule, or else of reporting that the task was impossible and that it had no other recommendation to make than that the legislature suggest a more practicable basis than road wear and time and extent of use, the commission arbitrarily chose perhaps the worst possible scheme with the excuse that similar bases were used in other states, notably Massachusetts and in Connecticut—in the latter case not enforced.

A conference of all business associations which might be interested in this high-handed effort to make good a deficit in state funds by taxing progressiveness in merchandise delivery was held at the Automobile Club of America in New York City on January 22. A resolution as follows was adopted:

> "It is the sense of this meeting that the passage of the bills which propose to ratify the schedule of fees established by the Motor Truck Legislation Fee Commission be strenuously opposed and it is also resolved that no additional tax should be levied upon motor trucks or omnibuses until the factors which enter into the destruction of our public highways shall have been accurately determined by proper investigation and that a committee be appointed to prepare a bill to create a commission with adequate resources and power to investigate the subject and report it to the legislature at its earliest opportunity."

At this time it was learned that the attorney-general of the State had found the act of the legislature in delegating the purely legislative function of fixing taxes to a commission was not constitutional, although the constitution of the State of New York is unique in that it contains no clause requiring fairness or equitability of taxes. In answer to this the backers of the measure, determined to tap this source of possible income, introduced the two bills above mentioned to ratify this schedule.

A joint committee on internal affairs from both houses was appointed and at 5 p.m., Tuesday, Jan. 23, announced a hearing to be held at 2 p.m. the day following.

Such precipitate action was explained at the hearing by the assertion that the measure had to be put through before Feb. 1 in order to permit the Secretary of State to order his plates and collect the fees. In contradiction to this, however, it was pointed out that the Secretary of State had already proceeded on the authority conferred upon the special commission by the last legislature, that blanks had already been sent out and some of the fees collected. It was shown that if any license plates were to be available by Feb. 1 they must have been ordered several weeks before this.

One of the legal service companies located in the shadow of the State House was taken to task by a subscriber to a legal bulletin because it had not been apprised of the hearing until the night before it occurred. He was answered that the bureau itself did not receive word of it until 5 p.m. on the night before and that such short notice was almost unhead of, from 2 to 4 weeks being the usual notice in advance.

Interesting bits brought out in the testimony showed how hastily and carelessly in its report the special commission had done its work. Mr. White pointed out that electric industrial trucks, which are largely operated entirely within the docks, warehouses and other private premises of their users with the exception of once in a great while crossing a street to get from one part of a plant to another, would under the bill be obliged to pay a tax as 2-ton trucks.

The joint committee having refused to grant a second hearing on the subject, the conference committee of motor truck interests decided to canvass every owner of motor trucks and omnibuses in the state, setting the facts before him, giving him a card showing the fees proposed, giving him a list of state senators and assemblymen and a form of protest, urging him to write his senator and assemblyman and demand a second hearing before passage of the bill, or in the event that the bill is passed by both houses before that is done, to address the governor a plea for a hearing before approving it. This form of protest is to be sent with all applications for licenses under the schedule proposed and under which the secretary of state is operating:

> "Secretary of State,
>
> "Dear Sir:
>
> "Herewith find our payment of registration fees as per license blanks issued by your office. We make such payment under protest and duress, and notify you in so doing that we reserve all rights.
>
> "Our protest is based upon the following grounds:
>
> "FIRST—That the powers conferred upon the Motor Truck Registration Fee Commission constitute an unlawful delegation of legislative authority.
>
> "SECOND—That the schedule adopted by the commission is not in accordance with the authority conferred upon it by the Legislature under Chapter No. 598 of the laws of 1916.
>
> "THIRD—That the tax is a discriminatory tax and unfair to owners of motor trucks and omnibuses.
>
> "FOURTH—That the imposition of such a tax is unconstitutional, being double taxation.
>
> "Yours very truly."

By Saturday night, Jan. 27, 25,000 of these circular letters will have been put in the mails.

The delegation which attended the hearing was composed, besides individuals from private car-hiring companies and the taxicab interests of the following committee:

R. H. Johnson, spokesman for the committee, Automobile Dealers' Assn.

Charles Thaddius Terry, counsel,
National Automobile Chamber of Commerce
American Automobile Assn.
Automobile Trade Assn., New York State
Automobile Trade Assn., New York City.

Roderick Stephens, president,
Motor Truck Club of America, Inc.

D. E. Dealy, chairman transportation committee,
New York (State) Furniture Warehousemen's Assn.

C. M. Geiger,
New York State Brewers' Assn.
Lager Beer Brewers' Board of Trade.

J. D. Blackburn,
New York State Coal Merchants' Assn.

A. F. Rice,
New York City Coal Merchants' Assn.

W. W. White,
Electric Vehicle Section, N. E. L. A.

Grant Wayne, secretary,
Van Owners' Assn. of Greater New York.

Charles G. Bond, counsel,
Motor Truck Club of America.

R. W. Hicks, secretary,
Mfrs. and Dealers' League of the City and State of New York.

George Stevens,
Adams Express Co.

L. R. Gwyn,
American Express Co.

J. Samuel Smoot,
Burns Bros., New York, coal dealers.

W. J. B. Nodine,
General Chemical Co.

Coming Commercial Vehicle Events

Feb. 15	New York City, Monthly Meeting Metropolitan Section, S. A. E., at A. C. A.
Feb. 20	Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.
Feb. 20	Philadelphia, Pa., Monthly Meeting, Pennsylvania Section, S. A. E.
Feb. 21	New York City, Monthly Meeting of the Motor Truck Club of America, Automobile Club of America, 247 West Fifty-fourth Street.
Feb. 21	Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.
Jan. 27-Feb. 2	Columbus, Ohio, Motor Vehicle Show.
Jan. 27-Feb. 3	Portland, Ore., Motor Vehicle Show, Dealers' Motor Car Assn., Armory.
Feb. 3-10	Minneapolis, Minn., Tenth Annual Motor Show.
Feb. 24-Mar. 3	Newark, N. J., Passenger Car and Motor Truck Show, First Regiment Armory.
March 3-10	Boston, Mass., Fifteenth Annual Motor Vehicle Show, Mechanics' Building.

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Controls Sale of Trucks in 50 Cities

Commercial Vehicle Motors Co. Formed in Chicago to Sell at Wholesale

CHICAGO, Jan. 26—A chain of agencies for the selling of motor-trucks in about fifty cities of the Middle West has been established. The new institution is known as the Commercial Vehicle Motors Co. At present it is selling Atterbury and Denmo trucks.

With Chicago as headquarters, branches are being rapidly established throughout Illinois, Ohio, Kansas and other neighboring States. This new chain of local outlets tends to make the ultimate distribution of motor trucks less of a retail matter and more of a wholesale proposition.

Four experienced field men continuously travel, looking for suitable locations and making analytical reports to headquarters. This places the officials of the company in a position to know the conditions in each city or territory they have under consideration.

When out of a prescribed area the proper and most advantageous location has been selected, a subsidiary company is incorporated and a manager placed in charge of the business. A stock of the lines of motor trucks is placed on the floor so that deliveries can be made right out of stock. A uniform system of finding and soliciting prospects of that territory is then installed. Two or more trained salesmen join the branch, to work under the manager and under the direct supervision of the general sales manager at the home office. The salesmen report daily upon each prospect interviewed, giving details of their interviews and sketching the hauling problem of each prospective customer.

These reports as they come into the office of the general sales manager are filed and listed. The salesman is given instructions and helpful advice as to how to secure the order from that particular prospect. Thus the home office is informed at all times as to the selling prospects and conditions of each territory.

The general sales department of the Commercial Vehicle Motors Co. is in charge of E. N. Manning, formerly sales manager for one of the large packing-house interests in Chicago. The systems that are being installed to handle the business embody many new ideas as well as many tried and proved principles of merchandising on a large scale.

The financial end and auditing department are in charge of J. K. Cheney, who has had many years of experience in this branch of the business. Each branch house is supplied with a simple but complete set of books. These are kept by the manager in duplicate, the forms of one set being sent daily to the auditing department at the home office, thus enabling the auditor to keep a controling hand on the finances of each branch.

The Commercial Vehicle Motors Co. also finances the time payment sales made by each of its branches and, when a sale is made of part cash and the balance notes, the branch sends the notes into the home office, where they are at once discounted and the cash remitted to the branch.

All trucks are purchased from the various factories and shipped to the Commercial Vehicle Motors Co., shipping draft attached to the bill-of-lading, thus relieving the factory of any financial burden and supplying a cash market for the factory.

The company is owned and controlled by its own board of directors, all experienced men in this line of business. The company expects to handle, through its various branches, several thousand motor trucks this coming year.

The company has branches installed and under full operation in the following cities: Chicago, Cincinnati, Milwaukee, Kansas City, Waterloo, Iowa, and Minneapolis, Minn., and by March 1 will have at least twenty-five thoroughly-equipped branch houses organized, and it is proposed to increase this to about fifty branches throughout the Middle Western States.

The company proposes to maintain a central clearing house in Chicago for the sale of second-hand trucks taken in trade by various branch houses.

MAXFER MAKES A TRUCK

CHICAGO, Jan. 23—The Maxfer Truck & Tractor Co., which has been making truck-forming attachments for Ford cars, is bringing out a new 1-ton truck complete which will be styled the Dependable and will sell for $1,195. The truck is equipped with a four-cylinder, 3½ by 5 in. engine, is worm-driven and has a number of features including electric lighting and starting equipment and a Bailey non-stall differential. The wheelbase is 130 in. and the loading space 4 to 6 ft. wide and 9 to 11 ft. long, according to the type of body. Rear tires are solid pressed-on type 34 by 4. The equipment includes cab, curtains and a windshield.

The new truck, together with the Maxfer company's Ford converting unit, will be exhibited at a special showroom directly opposite the Coliseum at 1512 South Wabash Avenue. During the show the company will make its headquarters at this salesroom. The company will produce 28,000 of its truck units this year and in addition will produce 2000 of the Dependable models. The Chicago plant is being quadrupled in size and in addition there is a plant at Martinsburg, Va.

The Maxfer company will give a dinner at the Chicago Athletic Assn., Jan. 31, for its dealers and salesmen.

FAGEOL IN PRODUCTION IN MARCH

DETROIT, Jan. 23—Production will be started in March on the 2-ton truck designed for the Fageol Motors Co., Oakland, Cal., by Cornelius T. Myers of this city. The 5-ton chassis will embody more of Myers' chassis lubrication principles, which are described in this issue. The basic idea behind this system of lubrication is the elimination of grease because of its dirt-carrying propensities and the substitution of oil with wick feed.

A factory is being equipped in Oakland, Cal., for the manufacture of these trucks and the Fageol passenger car. Louis Bill, formerly general manager of the Jeffery Co., and Webb Jay of the Stewart Warner Corp. are respectively president and vice-president of the company.

Millington Introduces Front-Away

Front-driven Light Delivery Vehicle to Be Made in Chicago

CHICAGO, Jan. 24—The Millington Motor Car Co., 30 North La Salle Street, Chicago, has entered the truck field with the Front-Away light delivery truck, a radical departure from previous designs in that it drives through the front axle and carries its frame unusually low.

The Millington company is a $500,000 Delaware corporation, of whose stock half is 7-per cent non-voting cumulative preferred of $100 par value. It absorbs the Millington Auto Engineering Co., which produced the Millington attachment to converting standard rear-driven trucks to four-wheel-drivers.

The Front-Away will be made in both a delivery and a runabout form, the delivery model to have a 1000-lb. capacity and to sell for $675. Save for its unusually low frame—about even with the hubs—the vehicle resembles standard designs. The engine is under the hood, which is of stream-line design and merges with a cowl dash. The radiator is a V type similar to that on Pathfinder cars. This extends sufficiently in front of the axle to conceal the middle of the axle. The front axle is a live one, with two bevel driving gears transmitting the drive by universals inclosed within globular steering knuckles.

The chassis has wire wheels and the rear axle is of the dropped type to clear the low frame. Semi-elliptics are used all around, the front ones being shackled at the front and pinned at the rear, thus taking propulsion by a pull instead of a push and making for steadier steering. The rear springs are suspended in the usual manner. Pneumatic tires are fitted.

WANT HUB TRUCK DISSOLUTION

COLUMBUS, OHIO, Jan. 26—Representing that it would be for the best interests of the stockholders, dissolution of the Hub Motor Truck Co. is sought in common pleas court by directors of the company, through Attorney J. J. Chester, one of the stockholders.

Attorney J. C. Ervin was appointed referee by Judge Bigger to hear contentions of directors and stockholders. Hearing was set for April 8. The company was organized with $300,000 capital stock for the purpose of putting out a new motor truck. One truck and drawings of others were listed among assets.

PENNSY DROPS TRUCK

PITTSBURGH, PA., Jan. 23—Production of its commercial model has been discontinued by the Pennsy Motors Corp. of this city. This concern was formerly the Kosmath Co., Detroit, manufacturing a vehicle from the designs of E. T. Birdsall. When it reorganized and moved to Pittsburgh it added a passenger model. From now on this will be the exclusive product of the concern.

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Atterbury Occupying New Additions

U. S. Business Sole Reason for Factory Outgrowth

BUFFALO, N. Y., Jan. 8—This week sees the completion of about $25,000 worth of improvements in the Atterbury Motor Truck Co. factory—largely looking toward increased production. Although there has been none, and at the present time there is no war order in the Atterbury factory,—the sales have been increasing by leaps and bounds until, to-day, there are enough unfilled orders on the Atterbury books to insure that 1917 will be the greatest year of its 13 years' history.

The improvements in the factory have been largely along the line of making possible a more efficient flow of the production work. John W. Van Allen, the vice-president, and J. R. Spraker, general manager, in conference with J. R. Coleman—chief engineer—have worked out a system of production progress which makes possible the turning out of more trucks in shorter time than ever.

W. A. Clare, general sales manager, has been sounding out the Atterbury dealers throughout the country on their expectations of business during the coming year.

SELDEN TO ADD 14,000 SQ. FT.

ROCHESTER, N. Y., Jan. 26—The Selden Truck Sales Co., this city, will add 14,000 sq. ft. of new buildings. Ground has already been broken and the work will be rushed to completion. The new building will extend west from the present plant, parallel with the tracks of the Rochester & Eastern Electric Railway. The past year was the biggest it has ever had.

LAMSON COMPLETES ADDITION

CHICAGO, Jan. 2—The Lamson Truck and Tractor Co., formerly the Zeitler & Lamson Truck Co., this city, has completed an addition to its plant. This company, after reorganizing, decided to enlarge the scope of its business and has now entered into a selling campaign for national and international distribution.

CHAMPION FACTORY READY FEB. 1

FULTON, ILL., Jan. 21—Champion Motor Car Co. will start production in its reconstructed factory Feb. 1. The output within 6 weeks from this time will be 270 light delivery cars per week.

BETHLEHEM MOTOR TO BUILD

ALLENTOWN, PA., Jan. 19—The Bethlehem Motor Corp., this city, recently organized, is arranging to erect the initial buildings of its proposed plant for the manufacture of commercial vehicles. The plant will be on property acquired along the New Jersey Central Railroad and will be equipped to produce 2000 trucks the present year.

DEARBORN ADAPTER REORGANIZES

CHICAGO, Jan. 26 — The Dearborn Motor Truck Co., Chicago, has just been reorganized as the Dearborn Truck Co., and the capitalization increased to $550,000, of which $500,000 is to be preferred stock. The company is incorporated under Illinois laws. A part of the common stock will be held in the treasury for the purpose of compensating deserving employees, as it is the purpose of the company to build up an organization of high grade men and those who make good will be given an opportunity to acquire part of this stock.

S. D. Porter, who was formerly vice-president and general sales manager of the Smith Form-a-Truck Co., has purchased an interest in the Dearborn company, and becomes its vice-president, treasurer and general manager. W. J. Kenrick, who founded the Dearborn Motor Truck Co. last March, remains as president of the new company. W. C. Farnsworth also remains with the new company as general auditor and has taken an increased interest.

Mr. Porter was formerly connected with the McCormick H. M. Co. and International Harvester Co. in responsible positions. Later he went with the Maxwell-Briscoe Co. in the automobile business.

C. E. Stuart, who was formerly associated with Mr. Porter as assistant general sales manager of the Smith Form-a-Truck Co., has also gone to the Dearborn company, as sales manager.

The company manufactures the Dearborn truck unit for converting Ford cars into 1-ton trucks. Several hundred agencies have been established throughout the country and they are represented in every large city.

The plant of the company is located at 1250-64 South Campbell avenue, Chicago, and its present equipment is sufficient to run out twenty-five units per day. Additional machinery is being installed, which will give the plant a capacity of fifty truck units daily.

15,000 MAXWELL 1-TON TRUCKS

NEW YORK CITY, Jan. 23—Walter E. Flanders, president of the Maxwell Motor Co., Detroit, Mich., has stated that, as a result of the reception of the new 1-ton Maxwell truck exhibited in the Hotel Biltmore during show week here, definite plans for a production of 15,000 of the vehicles have been formulated.

CONVENTION AT PACKARD PLANT

DETROIT, Jan. 20—A 2-day convention for dealers and truck sales managers started Friday at the Packard factory. Sales plans for 1917 were discussed. Representatives from fifteen Packard agencies were present.

ACME TRUCK ELECTS DIRECTORS

CADILLAC, MICH., Jan. 22—At the annual meeting of the Cadillac Auto Truck Co. the following men were elected directors: W. A. Kyser, C. J. Helm, John P. Wilcox, F. O. Gaffney, Henry Ballou, Henry Knowlton, Perry F. Powers, J. C. Ford and D. E. McMullan. Secretary Helm's report showed more than 200 trucks had been made and shipped during the company's first year.

ACASON WAS 3½-TONNER

In the Jan. 1 issue of THE COMMERCIAL VEHICLE, an illustration of the Acason 3½-ton truck was published over a caption stating it to be of 5-ton capacity. This was an error, as the Acason company states that the truck was of 3½-ton capacity.

Autocar Reveals New Service Wrinkle

Portable Parts Chest Extends Service to the Bush

NEW YORK CITY, Jan. 20—One of the most progressive steps ever taken by a motor truck manufacturer to give the owners of its trucks quick and efficient service has just been made by the Autocar Co., Ardmore, Pa., which to-day offered its Autocar service kit. This consists of a trunk-like box in which are furnished a selected list of spare parts for Autocars. The parts included in the box are determined by a consideration of the number of such trucks the owner may have and whether he is located one mile or many miles away from the nearest Autocar branch, service station or agency.

By the use of such a kit and by carefully selecting the parts carried in it, the probability of having to lay up trucks awaiting the receipt of spare parts would be greatly lessened and the owner benefited thereby in that he will be able to get his vehicle into service again much more quickly than by the usual methods.

A charge will be made for the service and at a slight additional investment unused parts may be returned so that an owner may keep on hand the parts which he has found need replacing from time to time.

The list of the parts included and the charge for the service will be given in full, together with illustrations of the kit, in a subsequent issue of THE COMMERCIAL VEHICLE.

SELDEN PRICES INCREASED

ROCHESTER, N. Y., Jan. 16—Prices of Selden motor trucks have been increased by the Selden Truck Sales Co. of this city on all but the smallest model. The present models and prices appear below:

	New Price	Old Price
¾-ton worm drive	$985	$985
1-ton worm drive	1,850	1,700
1-ton internal-gear drive	1,385	New
2-ton worm drive	2,350	2,250
2-ton internal-gear drive	2,150	2,000
3½-ton worm drive	3,150	2,950

At the same time the company has stated that a new 5-ton model will shortly be announced.

NEW D-E MODELS AND PRICES

NEW YORK CITY, Jan. 27—Two new models have been added to the line of the Day-Elder Motors Co., Newark, N. J., prices have been readjusted and the capacity of the Junior model has been increased from 1250 lb. to ¾ ton. The new models are a 1½-ton and 2½-ton. The line and prices now are:

¾ ton	$ 975
1 ton	1250
1½ ton	1500
2½ ton	1985

The two new models are similar to the older ones in general outline and have worm drive.

TREGO RESIGNS FROM KNOX

SPRINGFIELD, MASS., Jan. 26—F. H. Trego, who has been chief engineer of Knox Motors Co., has been succeeded by E. R. Gurney, who was formerly in the engineering department of the General Electric Co. and who has co-operated with Mr. Trego in the production of the Knox 300 hp. aeronautic motor.

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Divorces Garford for Gramm-Bernstein

Taylor Plans Better Service; Garford Forms Branch

NEW YORK, Jan. 26—The R. E. Taylor Corp., this city, eastern distributor of the Garford truck, has undertaken the sales and service of the Gramm-Bernstein truck. Its territory will include New York, Pennsylvania, New Jersey, Massachusetts, Connecticut, Rhode Island, Maine, Vermont, New Hampshire, Maryland, Delaware and the District of Columbia.

Taylor formerly handled the Garford line. His new contract runs for 20 years and he plans to render complete service throughout his territory, at cost. No free service is to be given; but the guarantee of parts will extend over the life of the truck. All service work will be done at cost, the only profit being made in the sale of trucks.

The Garford company is to establish all of the old Taylor houses, which the latter has vacated, as factory branches.

INDIANA DEALERS CONFER

NEW YORK, Jan. 26—A score of Eastern truck dealers were entertained in New York at a banquet given by J. W. Stephenson, treasurer of the Indiana Truck Corp., Marion, Ind.

The topic under discussion was the future of the industry and the burden of the speeches was that the truck industry has reached the point to-day that the automobile industry reached in 1909, at which time the big production of passenger cars commenced.

In 1917 the first very large production of trucks is under way. Dealers from New York, Wilkes-Barre, Pa.; Detroit, Philadelphia, Altoona, Pa.; Chicago, Boston, Valley Falls, R. I.; Pittsburgh and Marion, Ind., were present.

LITTLE GIANT DEALERS CONVENE

CHICAGO, Jan. 17—The annual convention of the sales and factory organizations of the Chicago Pneumatic Tool Co. was held at the Great Northern Hotel on Jan. 11 to 13.

The program included a trip to the company's plant at Chicago Heights, concluding with a banquet at the Great Northern on Saturday evening.

December 31 closed the biggest month and the biggest year in the history of the Chicago Pneumatic Tool Co. About 160 of the company's branch managers and representatives were in attendance.

NEW ENGINE CONCERN

PHILADELPHIA, Jan. 18—The North American Motors Co., Pottstown, Pa., which was incorporated last November to manufacture gasoline motors for motor vehicles and for general machine work, has bought the assets of the Potter Mackie Mfg. Co., with a factory in Pottstown, and the North American Motor Co., a partnership manufacturing gasoline motors.

Edmund J. Levine, president of the Fibreoid Co., New York, has been elected president of the North American Motors Co. S. C. Potter of Pottstown was elected vice-president; G. C. Lees, secretary and treasurer, and F. W. Fahringer, assistant treasurer.

This spring and early summer it expects to build a plant on a 4-acre plot which it has bought on Queen Street, Pottstown, which will be suitable for its work, the manufacture of 45, 30 and 20-hp. motors, formerly under the name of Hazard, for commercial vehicles.

PARKER GETS NEW RUST-PROOF

DETROIT, Jan. 17—In addition to the Richards, Allen and Parker rust-proofing process patents previously controlled by the Parker Rust-Proof Co. of this city, the concern has recently acquired the rights to the two patents of Thomas Watt Coslett and to all improvements on his process to be made by him in future.

SCHWARTZ WHEEL TO ADD

PHILADELPHIA, Jan. 19—The Schwartz Wheel Co., this city, has acquired property about 160 by 200 ft., adjoining its plant, to be used for extensions.

LEATHER TIRE GOODS CHANGES NAME

NIAGARA FALLS, Jan. 22—Woodworth Mfg. Co. is the new name of the Leather Tire Goods Co., which has been taken over in its entirety by this new company. The Woodworth company will carry on the business without change. There is no change in the personnel of the company.

BODY BUILDER ADDS

BRIDGEPORT, CONN., Jan. 26—The Metropolitan Auto & Carriage Co., this city, is building a new plant in addition to its present one. This company, which makes commercial vehicle bodies, expects to complete this structure about May 1, adding about 28,000 sq. ft. of floorspace.

TO TEST BRAKE LINING

NEW YORK, Jan. 23—Disinterested tests of brake linings are to be made by the Asbestos Brake Lining Mfrs. Assn. The association is at present preparing a way for these tests, which will be made by a well-recognized laboratory. The idea behind the test is that they will be of value to manufacturers in showing them the qualities resulting from various methods of construction, etc. It is also planned to do some general as well as engineering work, such as the provision of tariff protection for this young industry, etc.

The association was formed July 28, 1916, the president being A. H. Burdick of the Standard Woven Fabric Co., and the secretary and treasurer, C. J. Stover of Keasbey & Mattison Co. Among the members are the following firms: American Asbestos Co., Norristown, Pa.; Asbestos & Rubber Works of New Jersey, Camden, N. J.; General Asbestos & Rubber Co., Charleston, S. C.; Essex Rubber Co., Trenton, N. J.; Federal Asbestos Co., Paterson, N. J.; F. L. Horton Mfg. Co., Boston, Mass.; Keasbey & Mattison Co., Ambler, Pa.; Russell Mfg. Co., Middletown, Conn.; Manhattan Rubber Mfg. Co., Passaic, N. J.; Standard Woven Fabric Co., Walpole, Mass.; Staybestos Mfg. Co., of Philadelphia, Pa. The offices of the association are at Ambler, Pa.

Brooklyn to Revive Truck Shows

Separate Section of Exhibit for Commercial Models

NEW YORK CITY, Jan. 27—Brooklyn, which since 1912 has harbored the only commercial vehicle exhibition in Greater New York, will this year go a step farther and put on the only exclusive truck exhibition in the country. As was the practice in the days of national truck exhibitions, the event will occur the week following the passenger car exhibition, Feb. 24 to March 3.

This step was taken because the applications for space on the part of truck dealers were so heavy that it was impossible to accommodate any considerable number of them without infringing upon the space rightfully belonging to passenger cars. It is unfortunate that it is not possible to hold both shows simultaneously, but evidently the expense of renting two halls, decorating both, and running two staffs of show attendants and officers is too heavy for the Brooklyn Motor Vehicle Dealers' Assn. to consider.

ARMY POSTPONES NEWARK SHOW

NEWARK, N. J., Jan. 23—Owing to an order from the U. S. War Department to the First Regiment of Newark, requiring Federal inspection of the regiment, the Newark Show in the armory has been postponed one week. The new date is the week of February 24—March 3, and all the arrangements as originally made will stand.

The drawings for space took place Thursday, Jan. 25, as originally planned. The space was over-subscribed, but everybody was taken care of, some of the larger requests having been subjected to a pruning process.

The exhibitors were perfectly satisfied with the change. In fact, some of them were mighty pleased with it as it gave them a week longer to get their factory models, which, in these days of freight congestion, means a good deal.

TRUCKS AT PORTLAND SHOW

PORTLAND, ORE., Jan. 24—Commercial vehicles will be exhibited in a special room separate from the passenger cars and accessories shown at the Eighth Annual Automobile Show of the Motor Car Dealers' Assn. of Oregon to be held here Jan. 27 to Feb. 3. Eleven different makes of truck will be on view.

COMMERCE ON EXHIBITION AT CHICAGO

CHICAGO, Jan. 24—The Commerce Motor Car Co., Detroit, will exhibit its trucks during the local automobile show at its dealer's showroom, Commercial Motor Truck Co., 1718 Indiana Avenue.

COMMERCE IN BOSTON HOTEL

DETROIT, Jan. 26—The Commerce Motor Car Co., this city, through its inability to secure proper space at the Boston automobile show, will exhibit its trucks during the show in the lobby of the Copley Square Hotel. W. H. Brinkerhoff, eastern district manager, and George Wilcox, sales manager of the company, will be in attendance.

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British Motor Trade At Standstill

American Finds Restrictions Prevent Importation

NEW YORK, Jan. 17—Joseph A. Mackle, director of the Willys-Overland, Ltd., London, who for several years past has been an annual visitor at the New York shows, arrived in this city to-day too late for the show, due to steamship delays. Mr. Mackle expects to be in the country several weeks and will attend the Chicago show. At present gasoline is selling at 68 cents per Imperial gallon and each private motorist is given 2 gal. of gasoline a week for his private use. This means approximately 50 miles per week of motoring and because of such the use of cars has been very much restricted.

Beginning with Dec. 15, the government restricted the manufacturing of passenger cars in England by English makers. Previous to that time the Ford factory in Manchester and a few other manufacturers were producing passenger cars. Ford was making as high as 200 per week at its Manchester factory. Since Dec. 15 the activities of the Ford and other factories have been restricted to delivery trucks, ambulances, etc.

At present all of the motor factories are under the direction of the Minister of Munitions and for control purposes he has divided the entire industry into three broad divisions: A, manufacture of passenger cars; B, manufacture of commercial vehicles; C, repair work. The manufacture of class A has been stopped. A warning order has been issued to proceed more slowly in the manufacture of trucks. A recent order limited the amount of any one repair job to $50. This restriction has been imposed due to conservation of labor.

The extent to which manufacturing has increased in the British Isles may be illustrated by one example. Village X before the war was a straggling hamlet of a few hundred inhabitants. To-day there are over 20,000 men employed in the manufacture of munitions, and there is one row of munition factories extending over 8 miles. The buildings are not continuous but separated as required in all munition centers.

To date there has been no conscription of labor in the British Isles and no rigid regulation of drink or food. There have been requests for the public to restrain itself in connection with these matters.

Previous to the war there were approximately 4000 dealers and garagemen in the country. Many of these dropped out of business soon after the war and those remaining have been selling U. S. A. cars and trucks. Since the importation of U. S. A. cars has ceased, many London dealers have been using their few lathes on sub-contracts for munition manufacture. London dealers have been doing a big business in buying and selling second-hand cars.

There are still 2000 buses, the majority of which are operating in the more central part of the city. Women drivers are becoming common on taxicabs and light delivery vehicles.

CANADIAN MINES NEED TRUCKS

OTTAWA, ONT., CAN., Jan. 19—With the immense amount of activity in molybdenite and various other sorts of mining in the districts north and west of Ottawa, it goes without saying that a large field has been opened for the use of motor truck transportation.

There is every indication in that part of Quebec adjoining the capital that rich-paying mineral deposits are only awaiting the arrival of some method of transportation to get them to the production plants.

Already the Everyman's Car Co. of this city has sold a number of Ford trucks for use by mining concerns in the adjoining province, and now is negotiating with several individuals for the installation of heavy motor trucks for the transportation of molybdenite from the mine to the nearest railroad. The experience which the miners in the western American States have had with motor trucks makes it certain that within the near future there will be a general adoption of motor trucks by the Canadian mining activities.

TANK SECRETS LEAKING

LONDON, ENG., Jan. 6—Much of the secrecy which surrounded the manufacture of the now famous armored tanks has been dissipated. No war device built in England is kept such a secret as the tanks. They were built at Lincoln, where a high wall surrounded the factory. The workmen entered this inclosure and were not permitted to leave it or see their families for a period of 3 months. Each tank is fitted with two six-cylinder Daimler sleeve-valve motors of approximately 150 hp. The tank has four forward speeds, the maximum being 6 m.p.h.

MONTREAL RAPIDLY MOTORIZING

MONTREAL, QUE., CAN., Jan. 22—Many of the leading firms in Montreal have done away almost completely with use of horses for delivery work, among which may be included Goodwin's, Ltd., the big department store, which has now a large fleet of trucks of various makes and sizes. The heads of the city grocery firms and, in fact, all other businesses where there is a lot of livery work, have discovered that a good truck can easily do the work of four horses, and do it better and cheaper.

It is the same throughout Canada as in Montreal. The horse is slowly disappearing. The truck business, except for war orders, was not very good in Canada during 1916, due to the fact that users of this type of gasoline vehicle did not feel inclined to invest such a large sum of money during war times. It is felt, however, that the spring will see this branch of the business take a jump skyward.

Figures supplied late in December by officials in each of the nine provinces show the progress made in the number of commercial vehicles in use from 1914 to 1916, as follows:

	1914	1915	1916
Ontario	Inc.	Inc.	2,804
Quebec	384	528	900
Nova Scotia	7	17	24
New Brunswick	Inc.	Inc.	Inc.
Prince Edward Island	Inc.	Inc.	Inc.
Saskatchewan	275	Inc.	Inc.
Alberta	Inc.	Inc.	Inc.
Manitoba	98	200	277
British Columbia	363	835	2,336
Yukon	3	5	....
Total	1,130	1,585	6,341

The large increase in the use of the commercial vehicle by farmers to haul their grain, produce, etc., to market is an important factor in the industry. This year should see more motor trucks sold to farmers than ever before.

How and How Not To Export Motors

N.A.C.C. Meeting Brings Out Much Meaty Discussion

NEW YORK CITY, Jan. 23—More interest was shown by members in the Export Managers' Meeting held by the N. A. C. C. in New York on Jan. 12, than in any previous special meeting called by the chamber. There were in attendance eighty representatives from fifty-six companies. The nine papers on the program were delivered, followed by valuable discussion on each topic.

A committee of five representatives present was appointed to prepare recommendations regarding standardization of vehicles for the export trade to be submitted to the board of directors.

Among the ideas developed at the meeting were the following, some of which will be offered as recommendations to the directors at their next meeting:

Export trade should be conducted on the same fundamental principles as domestic business.

Executives of the manufacturing companies should visit personally the principal foreign markets.

Care should be taken to select the highest type of representatives to visit foreign countries.

China offers great potential market possibilities.

Foreign branches should be in charge of native Americans.

Prompt deliveries should be made on foreign orders.

Special extra inspection should be given all export orders before crating.

Service is a prime essential in foreign countries. Several exporters might combine in maintaining service stations. Foreign dealers should have ample stocks of replacement parts. A service policy similar to the Standard N. A. C. C. Policy should be put into effect in foreign markets.

Packing and marking instructions accompanying foreign orders should be followed in every detail.

A single additional inch in overall dimensions of crates may add largely to freight cost.

Road improvement propaganda should be sent to South America and other undeveloped countries.

Catalogs and other trade literature should preferably be translated and printed in the countries where it is to be used, preserving the idiomatic expressions.

Educational institutions should be urged to include the teaching of Spanish in their curricula.

The N. A. C. C. should appoint an Export Committee and maintain an export department at the general office.

The N. A. C. C. should seek to standardize motor vehicle nomenclature in leading foreign languages.

A block of space for an American exhibit should be taken by the N. A. C. C. at the international shows in London, Paris, Buenos Aires and other foreign countries.

It was the sense of the meeting that a man familiar with the motor vehicle industry should be appointed a member of the proposed Federal Tariff Commission.

Another export managers' meeting should be held at an early date.

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Army Truck Standards Make Progress

S. A. E. Considers Track, Radiators and Crankshafts

NEW YORK CITY, Jan. 26—A further conference of the Truck Standards Division of the Society of Automotive Engineers was held in the rooms of the society here to-day, attended by W. M. Britton of the Quartermaster Department at Washington, J. P. Utz, chairman-elect of the Standard Committee of the S. A. E., Coker F. Clarkson, secretary, and the following members of the division, each chief engineer or truck engineer of his concern:

H. D. Church, Packard Motor Car Co., chairman.
A. L. Riker, Locomobile Co.
G. W. Smith, Nash Motors Co.
B. B. Bachman, Autocar Co.
L. P. Kalb, Kelly-Springfield Motor Truck Co.
W. R. Strickland, Peerless Motor Car Co.
W. T. Norton, Selden Motor Vehicle Co.

At this meeting the chief points discussed were wheel track, radiators and crankshafts. It was pointed out by Mr. Britton that the army was very desirous of having a uniform gage for all its vehicles, but more particularly for 1½- and 3-ton truck, for these must trail each other where the road has to be broken through virgin ground. Where the tracks are of different gage it is difficult for the following vehicle, if of a different measure, to negotiate the ruts. He stated that the army transport wagon tread of 61½ in. would best suit the army and also pointed out the desirability of having uniform tracks, front and rear.

Another meeting will be held in Washington to-morrow and it is evident that the army is securing assistance which transcends valuation. It is the hope that the Quartermaster Department and the Truck Standards Division may in future work in still closer harmony by holding joint meetings.

U. S. STUDIES DELIVERY COST

WASHINGTON, D. C., Jan. 3—The view of Secretary of Commerce Redfield that the cost of city cartage and the local distribution of commodities by retailers represents an important factor in the high cost of living is more than borne out, it is believed, by the results of a preliminary survey which has been made by Director Sam L. Rogers of the Census Bureau.

For four important classes of commodities—coal and wood, ice, and department-store merchandise—which together represent a very considerable proportion of the cost of living, the expense of delivery, or cartage one way, according to the results of this preliminary survey, constitutes, on the average, more than 8 per cent of the total cost to the consumer. The percentages for the individual commodities, however, vary greatly from this average. For department-store merchandise the delivery expense, as indicated by the data so far obtained, represents less than 2 per cent of the selling price; for milk and dairy products the corresponding proportion is 12 per cent; for coal and wood, 19 per cent, and for ice, 45 per cent.

In view of the fact that intensive studies of the prices and general cost of handling of many foodstuffs—for example, butter, wheat and flour, and sugar—which have been made in recent years by city, State and Federal authorities, show the various percentages that the several general handlings or transactions add to the original price received by the producer, the officials of the Census Bureau decided to confine the scope of their initial investigation to that phase of distribution represented by the final one-way delivery—that is, delivery by the retailer to the consumer—of necessaries of life and to the cost of cartage in other forms; and since in the case of many articles of food the amount received by the producer is only one-half or one-quarter, or less, of the price paid by the consumer, it was the belief of Secretary Redfield—a belief borne out by the results of the preliminary inquiry—that the item of city cartage alone would be great enough to justify calling attention to the very large sums that the community is called upon to pay in maintaining the wasteful and highly complex systems of individual delivery which characterize retail distribution at this time.

When it is considered that in the city of Washington alone there are no fewer than 5000 retailers of all classes who make deliveries of their various goods, and that the delivery service of these dealers ranges from the well-organized and highly efficient system of the large department store, at a relatively low cost, to the comparatively expensive—because small and poorly equipped—service of the corner grocer, which he is compelled by competition to maintain, it is apparent that this one form of the cost of city cartage represents an annual expenditure of millions of dollars, much of which could be saved by better organization. At any rate, the results of the preliminary survey are considered by Secretary Redfield to be sufficiently striking to justify him in directing the Census Bureau to make a further and more exhaustive study of the subject. This study will cover not only the cost of the final delivery from the retailer to the consumer but also the cost of transferring goods from the railroad station to the store or delivery station, such as a milk depot, and also cartage costs as they appear in other connections. This expense is an item of importance, but it was not feasible to make any investigation of it in the course of the preliminary survey.

CONNELL, S. A. E. SECRETARY, DIES

MILWAUKEE, WIS., Jan. 23—Herbert L. Connell, secretary of the Mid-West section of the S. A. E., and instructor in automobile practice in the Milwaukee Continuation School system since 1914, died at his home in Milwaukee on Friday, Jan. 19, aged 29 years. Mr. Connell was a native of Detroit and was graduated from the University of Michigan, college of mechanical engineering, in 1911. He was associated with several Detroit factories, including the Packard, for 3 years before coming to Milwaukee. He was a member of the committee on standardization of the S. A. E., and a well-known writer on technical subjects. Mr. Connell was a member of the Milwaukee Press Club. The funeral was held Monday, Jan. 22.

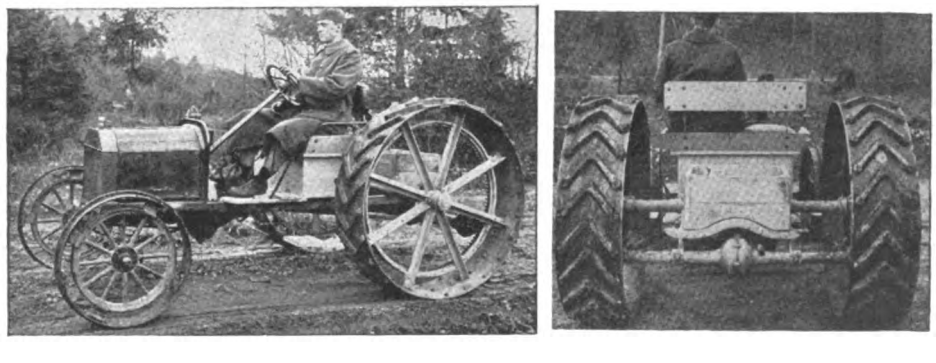
GLOBE IN ST. LOUIS

ST. LOUIS, Jan. 29—Globe trucks are to be made in St. Louis in the future. The Globe Motor Truck Co. of this city has taken over the assets of the business formerly conducted under a similar name at Northville, Mich. The Globe truck until recently was made by a department of the Globe Furniture, Northville, Mich. The principal model is a six-cylinder 2¼-tonner.

Universal Tractor Attachment

APPLIED to a small car chassis with the minimum of change, the Universal tractor attachment recently brought out by the Gerlinger Motor Car Co., Tacoma, Wash., is built to sell for $275. It comprises a pair of large tractor wheels on a tubular axle which slip on over the frame at the rear. Between it and the rear axle, which is behind it, are two radius rods and the frame is rigidly supported from the tractor axle. In place of the rear wheels, two spur pinions are secured, meshing with internal teeth on a ring secured to the spokes of the tractor wheels. The only change in front is the removal of the front tires and the substitution of steel tires by four clamping blocks.

The rear wheels are 52 in. in diameter with 14-in. faces fitted with V-shaped traction lugs, a water circulator is fitted to thermo-syphon cooled vehicles. It is stated that the tractor attachment may be removed from the chassis, the rear spring, rear wheels, front tires and body restored and the vehicle reconverted into a passenger chassis or truck in 2 hours.



Ford tractor attachment which hails from Washington and permits restoration of passenger body

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Gasoline Muddle Puzzles U. S. and Oil Men

By A. Ludlow Clayden

Pointers from the Gasoline Conference

¶ Gravity is no indication of the quality of gasoline
¶ Fraud by the retailer is the greatest trouble today
¶ No one can define an ideal gasoline
¶ The volatility of the fuel obtainable will decrease in the future
¶ Engineers must build engines to handle lower grade fuels
¶ Legislation now might increase price

WE are rapidly coming to the end of gasoline as it is understood today, and in the near future we shall have to use a fuel that is not unlike the present-day kerosene. This stands out from among the many points made at the most important conference on the fuel situation ever held.

The Bureau of Mines and the Bureau of Standards on Jan. 25 and 26 called a hearing at Washington, summoning representatives of oil refiners large and small, of motor vehicle engineers and of state and municipal legislatures. It was well attended, many men with famous names being present. It was a frank and free meeting in which each speaker spoke his thoughts, and it showed beyond all possible dispute that the fuel situation is a grave one, and that the motor and oil industries must get together to work out the problems ahead.

There has never been any gathering of a like importance. Held by the wish and under the auspices of the Federal government, its purpose was to determine how the user of internal combustion engines could be protected against fraud. To determine how a man wanting to buy suitable fuel for his engines could be sure that he was getting it at a fair price. That abuses of the most barefaced sort exist was proved, that the correction of these abuses will be very difficult was made obvious, but most of all, that the Bureaus concerned, that the oil industry and that the motor vehicle engineers are going to settle the matter on co-operative lines was also made manifest.

The meeting had as the main question before it this:

What is gasoline?

The answer was:

Nobody knows.

On the face of it this is absurd, but that it is *not* absurd became evident as the meeting progressed. Neither the oil man nor the engine builder can say what is gasoline and neither one nor the other can say what it ought to be.

Gasoline is Whatever Engines Can Use

The following is the only possible definition: Gasoline *must* contain enough highly-volatile hydrocarbons to make the starting of a motor vehicle engine easy by the customary methods of cranking. Gasoline must *not* contain fractions so heavy that they cannot be burnt in the ordinary process of combustion as it takes place in a good, modern engine.

The trouble is that nobody can say either how light or how great in percentage the light fractions should be, nor how heavy and in what proportion the heavy ends may be present. In all probability a committee will be formed consisting of representatives of the bureaus, of the oil industry, and of motor car engineers, whose purpose shall be to settle these problems. The resources of the bureaus will be available and the oil men's associations will provide additional money if necessary. All parties are anxious that the matter be cleared up, and cleared up quickly.

The big difficulty with gasoline is the large number of opportunities for adulteration which occur between the refining process and the time when the liquid goes into the tanks of the vehicle. From the refiner the gasoline goes to the jobber who buys from different sources and probably mixes different sorts by dumping different carloads in the same main tank. The jobber has the opportunity of adding to the gasoline something which he buys under a different name, such as kerosene or distillate. He may do this and yet produce a perfectly satisfactory fuel. There are gasolines on the market to be bought at the refineries which are actually *improved* by the addition of kerosene.

From the jobber the fuel goes to the tank wagon and a dishonest teamster has ample opportunity for adulterating the liquid it is his duty to deliver to the retailer. Six drivers in Detroit were recently caught making a fifty-fifty mixture of the jobber's gasoline and kerosene before delivering to the retailer. Finally, the retailer can again blend or mix just as the jobber can.

Trademark Buyers' Safeguard

Here comes a very crucial point. If the refiner supplies Blue Moon gasoline, the jobber who handles this or the retailer or anyone else who adds anything to it is guilty of fraud if from refinery to private user the product is sold as Blue Moon gasoline all along the line. If, however, either jobber or retailer buys Blue Moon gasoline, mixes something with it, and sells it as Pink Sun gasoline he is not guilty of any fraud whatsoever.

It was reported to the bureaus by many of the speakers that a regular habit among a certain class of dealers is to buy a proprietary brand of gasoline and sell it at the marked figure, say 18 cents, under its own name. They will take some of this, debase it by kerosene additions and sell it under some fancy name of their own at a cent or two a gallon more and the users buy the dearer product under the impression that it must be better. This, of course, is plain dishonesty, yet it is a kind of dishonesty which a few laws exist to stop. That it must be stopped somehow or other is obvious. Just how to stop it is at the present moment up to the Bureau of Mines and the Bureau of Standards, but from their 2-day session with the oil men and other interested parties they obtained very few concrete suggestions.

From all over the country comes the cry that gasoline is being adulterated, that what is being sold now makes starting very difficult and provokes rapid carbonization. Throughout the country, legislatures, both state and municipal, are drafting bills to regulate the sale of gasoline. In a number of districts there are already laws in existence. Nearly all these legislatures are appealing to Washington for guidance, are appealing to the Bureau of Mines and the Bureau of Standards to give them rational basis for a law which will protect the motorists from fraud, which will insure that when he buys gasoline and gets what he wants even although he is incapable of describing in scientific detail just what it is that he does want.

The District of Columbia has suggested that a national law might be passed governing interstate commerce in some way defining gasoline and that this law could be taken as a model by the states or the municipalities. At the Washington meeting practically all the oil companies, both large and small, were represented, and with but a single exception they all opposed any kind of legislation whatsoever. They opposed it for two reasons: first, because they believe it impossible to define the meaning of gasoline without increasing the price or restricting supply; and, second, because laws mean inspectors, inspectors mean graft, graft means increased price or decreased profit.

At the same meeting were representatives of states and cities, who, with one accord, declared that whatever Washington might decide to do, in their respective districts there would be laws. To this the response of the oil men is, if there must be laws let them be uniform laws and let the aim of legislation be not the definition or specification of gasoline but let it be something to prevent the sale as gasoline of something which is not gasoline, as the term is

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ordinarily understood in commercial circles at the moment. The oil men will all support a legislation which will allow the refiner to sell gasoline of any specification and will insure that the retailer delivers to his customers that self-same liquid. They will oppose a law which places any limitation upon what the refineries may sell in bulk as gasoline.

This sounds a very unjust thing, but it is in truth by no means what it sounds. In the last few years gasoline has grown steadily less and less volatile, and this decrease in volatility will continue in all probability through future years. This gives us an alternative.

We may make a distinction for gasoline with sufficiently wide limits to cover all the satisfactory kinds on the market today. If this is done the chances are that in a year or two years' time 100 per cent gasoline, according to that specification, will not be obtainable; or we may legislate to enforce the sale by the retailer of what the refiner likes to call gasoline and this means that from year to year the volatility of gasoline will decrease. But its average composition throughout the country probably would be fairly even on any given date.

In order to understand the situation it is necessary to appreciate the meaning of a distillation curve. In testing gasoline a small measured quantity is put in a flask and is boiled away, the vapor being condensed and led to a graduated measuring glass, in the neck of the flask is a thermometer. The accepted method is to observe the temperature at which successive proportions of the liquid have been boiled off. For example, the temperature may be read when 20 per cent has passed over into the condenser, again when 50 per cent is gone and again at 90 per cent. Finally, as the last drop in the flask vanishes, we reach the dry point or end point where the temperature again should be observed. The temperature when boiling first starts is known as the initial point. A pretty good gasoline in the ordinary sense of the term would be something as follows: 25 per cent boiling off before reaching temperature of 225 Fahr., 50 per cent boiling off before reaching a temperature of 265 Fahr., 90 per cent boiling off before reaching a temperature of 340 Fahr., dry point, 400.

End-Points Are High

Now there are very few gasolines on the market today with a dry-point as low as 400; 450, which is well in the kerosene range, is quite usual. Dry points up to 500 are not uncommon. Furthermore, these high dry-points can come in gasolines and be perfectly satisfactory in use. At present the engineers cannot say how high a dry-point they are prepared to cope with. They cannot say how low an initial point they want. They cannot say whether they want a curve which runs up very quickly and then goes along pretty nearly parallel to the base line, or whether they want a curve ascending in a smooth slope from the initial to the final temperature. The oil men apparently cannot help them.

There is a very great deal to be said in favor of a definition of gasoline made by specified distillation curve limits. The fuel must be such that it will operate satisfactorily in a present-day engine. The engines of the future are going to burn almost anything in the way of liquid fuel. It will be a very short time before the truck which will both start and run on kerosene is at least as common as the gasoline engine. At that time what is today good gasoline will still be required to run the 3,000,000 cars now on our roads. The other machines, according to their degrees of ability, will be satisfied by 80 per cent, 60 per cent, 40 per cent gasoline mixtures.

It would be quite easy to handle gasoline in this way just as alcohol is handled commercially. Nobody ever sees pure alcohol. It is always sold in mixtures with so much per cent alcohol and so much water. We can do just the same with gasoline. A manufacturer will advertise his vehicle to operate on say 50-per-cent gasoline, and the chances are that if gasoline were defined today next year or the year after dealers would have in stock a little 100-per-cent gasoline and a large quantity of 60 or 70 per cent. By this means it is argued the motorist would be able to know what he was buying.

Another recommendation is that a definition be established with a view that it be revised from year to year as occasion demands. The great cry of the oil men is that if any recommendation is placed on what is gasoline it will limit the amount of suitable motor fuel which can be produced from the wells. They also seemed to hold a general opinion that if a dealer has two grades or rather is selling at two prices, the majority of people will buy the dearer liquid. No positive evidence was produced in support of this somewhat extraordinary claim, yet it was again and again stated that a dealer who had fuel at two prices sold most of the dearer quite without regard to the respective qualities. At the same time it was agreed that what the users want is the cheapest possible fuel which will run their engines. This was stated over and over again and flatly contradicts the other statement. It would seem likely that the truth is that the average man is anxious to get the cheapest fuel possible and believes that by paying a higher price he will get something which will make starting easier.

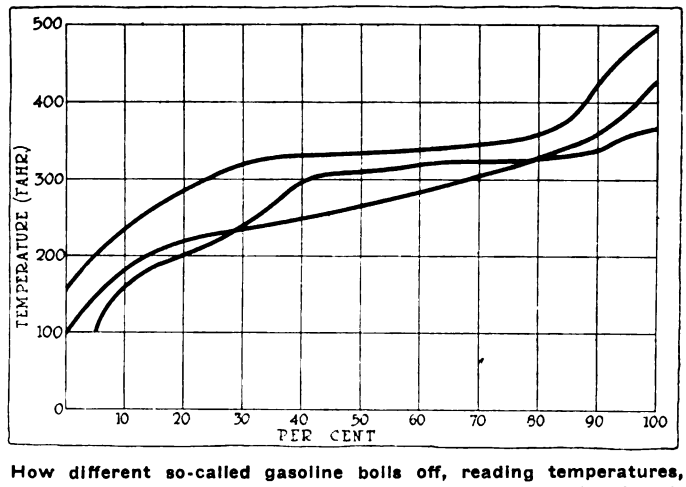
Gravity a Useless Test

On one point, and on one point only, was there complete unanimity, this being that gravity is no longer of any value whatsoever in specifying a motor fuel. Any specification ought to be a measure of volatility. Years ago the gravity or the Beaumé was a measure of volatility, but it is so no longer. A heavy fuel today can easily be more volatile than a lighter one.

The meeting, as already stated, was very well attended and it would take a column or more to give the names of all the important people present. To give just a few as showing the character of the meeting may be mentioned Dr. W. M. Burton of the Standard Oil Co. of Indiana, C. D. Chamberlain, secretary National Petroleum Assn., Dr. F. C. Robinson, chief chemist, Atlantic Refining Co., Mr. Grant, secretary, Independent Oil Men's Assn., R. L. Welch, secretary, Western Oil Jobbers' Assn., Guy Stevens, chief attorney, the Texas Co., J. C. McCabe, head of the department of safety engineering of the City of Detroit, Otto H. Klein, Board of Estimate and Apportionment, New York City. The Society of Automotive Engineers was represented by A. Ludlow Clayden, ex-chairman of the Standards Committee and H. L. Horning, member of the Council.

Representatives of many other individual oil companies and of several states and cities were also there and it was very noticeable that the oil companies usually had two or more men representing the legal side and the technical side. The chief chemist and chief attorney were a very usual pair.

The meeting was most wonderfully handled by Dr. C. W. Waidner of the Bureau of Standards. In passing a most hearty vote of thanks to the bureau, it was remarked that Dr. Waidner and his associates had throughout the 12 hours exhibited no prejudice but had taken up the points, asked questions and argued details for the sole purpose of extracting the maximum of information. The words of Mr. Saybolt of the Standard Oil Co. of New Jersey were that the oil men are strong for the bureaus and strong for the work they are trying to do, and above all, strong for the way in which they are endeavoring to do it.



How different so-called gasoline boils off, reading temperatures, vertically and percentages horizontally. The extreme right of each curve is the end-point

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Motor Trucking Centers of America—V

PITTSBURGH

Iron City Wedged in Narrow Valley Between Hills—Most Streets Poorly Paved and Narrow

PITTSBURGH, PA., Jan. 25.—Steep hills and narrow, poorly-paved streets make Pittsburgh a city whose exactions on motor trucks are perhaps the most severe of any city in the United States. It is a city irregular in shape but roughly rectangular. The main business section is fairly flat and is included within the triangle formed by the junction of the Allegheny and Monongahela rivers forming the Ohio. On the outsides of the triangle formed by the valleys of the first two rivers mentioned and on the third side of the triangle drawn between the rivers at about 2½ or 3 miles from the apex, rise steep hills like the seats of the Roman amphitheaters about the gladiators' arenas which they inclosed.

Pittsburgh Built on Hills

Rome was built on its seven famous hills. Pittsburgh's population and industries are spread out over perhaps twenty-seven hills, the grades of which vary from 15 to 45 per cent. It is hard for one to walk for more than 10 minutes in almost any part of the city in which grades of at least 10 to 15 per cent are not encountered.

The great majority of the city's residential areas are located in the surrounding hills. Pittsburgh's great manufacturing establishments are located along the valleys of the Allegheny and the Monongahela, the most important of such plants being just outside of the city's corporate limits but within the metropolitan area included inside a 10-mile circle drawn about the city hall as a center.

This means that the motor trucks used in the delivery of all kinds of goods from manufactured products produced at any of the city's 2369 separate plants to foods and the other necessities of life like clothes, coal and ice, must negotiate hills with grades in excess of those found in any other cities of the United States with the possible exceptions of Los Angeles and San Francisco, Cal., Cincinnati, Ohio, and Kansas City, Mo., in all of which there are larger stretches of plain than in Pittsburgh.

No Weaklings Survive

These conditions imposed upon motor trucks mean that they must be provided with much lower final gear reductions between the motors and the rear wheels in order that they may ascend the steep grades without difficulty. The cooling systems of the trucks used in the Pittsburgh district must also be of ample capacity in order that the motors shall not overheat in continuously climbing one hill after another. Brakes should be of slightly larger size than required in other cities in order that the trucks may be kept under control easily when descending the steep grades leading down into the semi-flat area in the heart of the city.

Streets in Poor Condition

These conditions could be met easily were it not for the additional exactions placed upon the trucks by the city's rough pavements which are further aggravated by their poor state of upkeep. The stone-paved streets are rough and uneven and the asphalt pavements are similarly uneven and often rutted. The poor condition of the city's streets has been caused by the apparent inability of the muncipality to keep pace with the great increase in the motor traffic. Many streets have double the traffic carried two years ago. Pittsburgh's present roadways were never built for the great volume of vehicular transportation now passing over them. Accordingly they are wearing out much faster than they can be kept in proper repair.

Such poor pavements and the many steep hills require that trucks which are to survive in the Pittsburgh territory must be strongly built. Even then they wear out much faster than in such cities as New York, Detroit or Chicago. They are subjected to a tremendous amount of vibration in passing over the rough pavements at anything better than horse-pace speeds. This vibration tends to rack them to pieces and the useful lives of the trucks are at least one year less than those commercial vehicles in the same class of work in any of the three cities mentioned above. This is especially the case when the trucks are mounted on solid tires, for such tires admittedly cushion the driving mechanism to a lesser degree than do pneumatics.

It would seem, therefore, that the Pittsburgh territory offers a golden opportunity for the giant pneumatic which is now becoming popular in other sections of the country. Many of the truck users interviewed within the metropolitan district of the city state that the average mileage to be expected from solid tires is not over 5000.

In any event, trucks which expect to succeed in the almost mountainous country around the Iron City must be ruggedly built. Every part must have a slightly higher factor of safety than is required in other cities if the life of the vehicle is to be the same in either case.

This could undoubtedly be accomplished in another way by carrying slightly less than capacity loads. Unfortunately Pittsburgh's truck users as a general rule are not sufficiently educated to put such a practice into operation and rather err on the side of overloading rather than underloading. As a result, their trucks wear out faster than in other cities.

When worn out such trucks may be rebuilt to give several years more of efficient service provided the trucks have the material in them and in sufficient quantities. Vehicles whose parts have been reduced in weight to dangerously near the critical point where strength has been sacrificed to lessen weight, do not generally give satisfactory service after passing through the rebuilding period.

Inclined Vehicular Tramways Help

Seven inclined tramways for vehicles and passengers have been built on the sides of as many of the city's hills to help ease the burdens placed upon the vehicular transportation means by the many steep grades. These tramways are much the same as those used to carry tourists to the summits of many of our famous mountains except that they are naturally much shorter in length but with an equal degree of incline in many cases. The grades vary anywhere from 12 to 40 per cent. The inclines are made in duplicate tracks, one car ascending on one track while that on the other is descending. The cars themselves are built with a horizontal platform placed at an angle with the hill. Some of the inclines carry both passengers and vehicles at the same time while others are for vehicles alone. These inclines are all owned by private corporations and are run under the supervision of the Public Service Commission, operating during fixed hours daily except Sunday, although the passenger ones run on Sundays as well.

Inclines Help Horse Wagons

Such mechanical means for surmounting the conditions imposed by nature have been of greater benefit to the horse wagon than the motor truck. Steep hills are harder upon horses than upon motor

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trucks because of the quicker fatigue of the flesh as compared with the metals which enter into the motor truck make-up. That the horse wagons have taken advantage of the inclines to a greater extent than the motor vehicles is borne out by the figures secured from a typical incline, that owned by the St. Clair Inclined Plane Co. This incline carried an average of 1500 vehicles per month during the past year, approximately 1000 of which were horse-drawn. The planes are also a great benefit to the pedestrian, as is proven by the fact that the railway mentioned above carried on an average of 35,500 passengers per month during 1916.

Incline Tolls Reasonable

The rates of toll charged seem high yet are fairly reasonable when it is considered that in some case they enable a long up-hill climb of several miles to be avoided. One-horse wagons are charged 20 cents for a one-trip or 30 cents for the round trip; two-horse teams, 30 and 45 cents, respectively, and motor trucks 50 and 75 cents. Passengers pay 5 cents a trip, but may also receive transfers to the surface car lines in some instances. Books of fifty tickets may be had at $1.25.

Although the hills to the south of the city directly in back of the Monongahela, where it joins the Ohio, have been pierced by trolley car tunnels, none for vehicles has as yet been built, although their construction has been agitated for several years.

Unlike most cities bounded on two sides by rivers, Pittsburgh has no ferry problem. Only one ferry is in use, the others having been discontinued after the building of the city's twelve vehicular bridges. Five of these span the Monongahela and the other seven the Allegheny. Although one-way traffic is maintained on three or four of these, the service rendered is sufficiently good to eliminate traffic congestion across them, for the reason that all are of the fixed-span type, the vessels using the rivers passing under them.

Public Wants Quiet Pavements

Aside from the reduction of the burdens of the vehicles which have to traverse the city's rough and uneven streets, by means of the inclines, there has been a tendency to better the pavements insofar as the capital at hand would permit. This has not been altogether successful for the reason that the public at large and the store owners in the business section of the city are in favor of asphalt instead of block stone because of the noise reduction, but irrespective of the wearing qualities of the two classes of pavements. It has been further hampered by an apparent indecision on the part of the city engineers as to just what kind of new pavement must be laid to meet the present-day needs as occasioned by the vast increase in motor-vehicle traffic.

Most of the city's streets, with the exception of two or three of the main highways leading out of the business section, are 40 ft. wide, with a street width of 22 ft., and 9-ft. sidewalks on either side. On Jan. 1, 1917, the city had approximately 636.4 miles of improved streets, made up as follows:

	Miles
Wood block	10.2
Block stone	254.9
Asphalt	291.7
Brick	57.0
Irregular stone block	4.3
Cobble stone	5.7
Macadam	12.4
Plank road	.2
Total	636.4

From the above it is seen that the city has but 67.2 miles of brick and wood block pavement which are suitable for continuous heavy traffic of either passenger cars or motor trucks. The 265 odd miles of rough stone pavement explain why it is that motor trucks wear out excessively fast.

Notwithstanding these evident drawbacks of hills and poor pavements, motor trucks are increasing fast, while horses are decreasing. There are approximately 2,500 motor trucks of ¾ ton capacity and overworking in the metropolitan district. Of these about 500, or 20 per cent, went into service last year. In addition to the trucks given above, there are perhaps from 1,000 to 1,500 commercial vehicles of less than 1,500 lb. capacity, 1,000-lb. delivery cars built as such and many covered passenger cars and a few cars whose carrying capacity has been increased by means of Ford adapters or the like.

Horses Decrease 4 Per Cent

In contrast with this showing of the motor truck during the past year, horses have decreased 4.2 per cent, notwithstanding that Pittsburgh's population has increased 1.3 per cent during 1916. There were 12,816 horses in the city on Jan. 1, 1917, and 13,378 at the same date the year previous, thus showing an actual decrease of 562. The decrease of work horses and those used to pull private carriages has been approximately the same as is shown in the following tabulation:

	End of 1915	End of 1916
Horses, one-horse wagons	5,288	5,102
Horses, two-horse wagons	6,954	6,758
Horses, three-horse wagons	66	57
Horses, four-horse wagons	8	None
	12,316	11,917
Horses, one-horse buggies	708	587
Horses, two-horse carriages	354	312
Total	13,378	12,816

The main causes for the great increase of motor trucks during the past year have been the better business conditions as set up by the tremendous war orders, a further development of the principle of industrial imitation, and the fact that Pittsburgh is a great center to which the populations of the nearby towns and cities flock to do their purchasing.

Pittsburgh leads the world in the manufacture of iron, steel, glass, electrical machinery, steel cars, tin plate, air brakes, fire-brick, white lead, cork and aluminum. Practically all of these materials have been greatly in demand by the warring nations, whose facilities in those particular industries have been shifted over to the manufacture of firearms and ammunition. Many of the Pittsburgh plants have also been engaged in the manufacture of similar materiay. Some of this goods underwent various operations in plants at some distance from one another, each of which, perhaps, performed a special operation and necessitated the delivery of the partly finished product to another factory for the final finishing. Motor trucks have performed a reliable and quick service in this kind of work in much the same manner as did the fleet of trucks owned by the E. W. Bliss Co., Brooklyn, N. Y., and described in full in the Aug. 15, 1916, issue of THE COMMERCIAL VEHICLE.

Competition Forces Truck Buying

The increase in trucks due to the principle of industrial imitation has been due to the progressiveness of Pittsburgh merchants as a whole. If one merchant in any particular line displaced his horses by trucks, and thereby offered a quicker and better service, it was not long before his competitor did likewise. Many trucks have been bought on this basis alone, and while such merchants have found that the trucks cost more to operate and maintain than horses, due to the severe conditions under which they have to work, they have found that they enable the delivery area to be greatly increased, thereby making possible a larger gross business and an increased net profit.

The magnitude of the area dependent upon Pittsburgh for the necessities of life may be realized when it is considered that, although there are but 579,090 people within the corporate limits of the city, there are 1,042,855 within a 10-mile radius from the city hall. Compared on city population, Pittsburgh is the eighth city, and the fifth when the densely-populated suburban territory is considered.

Most of the department stores in the city make two deliveries per day within a 30-mile zone, and several deliver as far out as 45 miles from the store. Similarly, coal, ice, beer and other articles of food and clothing are being delivered farther out as the suburban population increases. This makes for an increase of trucks, for they are the only means of quick and direct delivery at such distances.

Department Stores Lead in Trucks

As a class, Pittsburgh's department stores are perhaps the largest users of trucks in the city. Of the 2500 trucks of ¾ ton capacity and over in service, between 250 and 300, or 10 per cent or more, are owned by department stores. The use of trucks by department stores has really been forced upon them by the demands of the outlying population, which comes to the Iron City to shop. As soon as one store motorized, the others followed suit, so that they would be on the same basis as their competitors. The use of trucks is not alone confined to the larger department stores, but is universal, even the smaller concerns maintaining motor vehicle fleets of four or five trucks.

(To be continued.)

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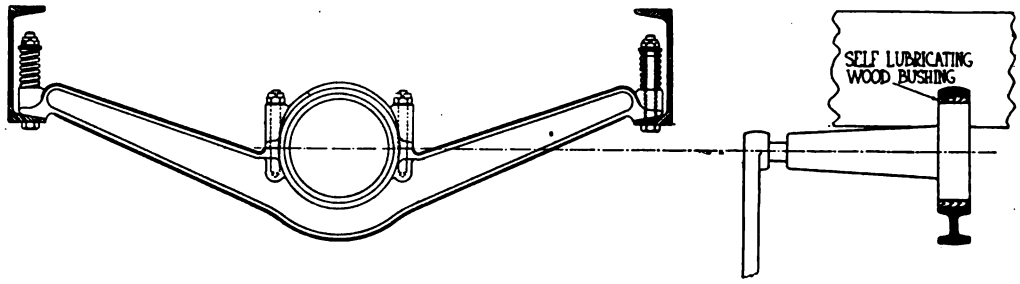


Fig. 1—Beam at front of Fageol engine, supported on coil springs and having a self-lubricating wood bushing for the motor front end

Magazine Oiling in Fageol, a New California Truck

Chassis Frame of Exceptional Flexibility—Unit Powerplant and Worm Drive

DESIGNED by Cornelius T. Myers, formerly of the Timken-David Brown Co., the new Fageol truck is to be manufactured by the Fageol Motor Co., Oakland, Cal. The new concern is also to manufacture the highest-priced car in America and in its truck model has essayed the construction of high-quality vehicles without regard to any price maximum, so long as the cost is justified by results.

Details of the new vehicle are lacking but a few general features are known. It has not passed beyond the design stage as yet and so far is chiefly interesting in the new features incorporated in the plans.

The truck is of 2 tons capacity, of conventional outline, but has a number of unique features. One of these is the method of magazine spring lubrication. Another is a frame construction of unusual flexibility. An odd hood design, with ventilators at the top, is employed and the three-point support of the engine is accomplished by a spring-mounted bar in front with a self-lubricating wood bushing about the crankshaft.

The vehicle employs a Waukesha 3¾ by 5¾ engine with option of a 4¼ bore if more power is needed. It is mounted in unit with the clutch and gearbox, has a Zenith carbureter and magneto ignition with fixed spark. A cast-case radiator is employed. The clutch is a Borg & Beck and the gearbox of the constant-mesh individual-clutch type.

Drive from the gearbox is by a divided shaft with three universals and a bearing at its midlength. Final drive is by an overhead worm-driven axle with both brakes internal on the same drums.

The spring-bolt lubricating device consists of cast brackets with cored-out chambers within them for the carrying of oil with passages drilled out to feed the oil to the bushings and into the bolts, wicks being used to siphon the oil from the storage chamber to the passages whose inlet is placed high on purpose to prevent the oil flowing into them and rapidly leaking away.

Although it is not possible to determine

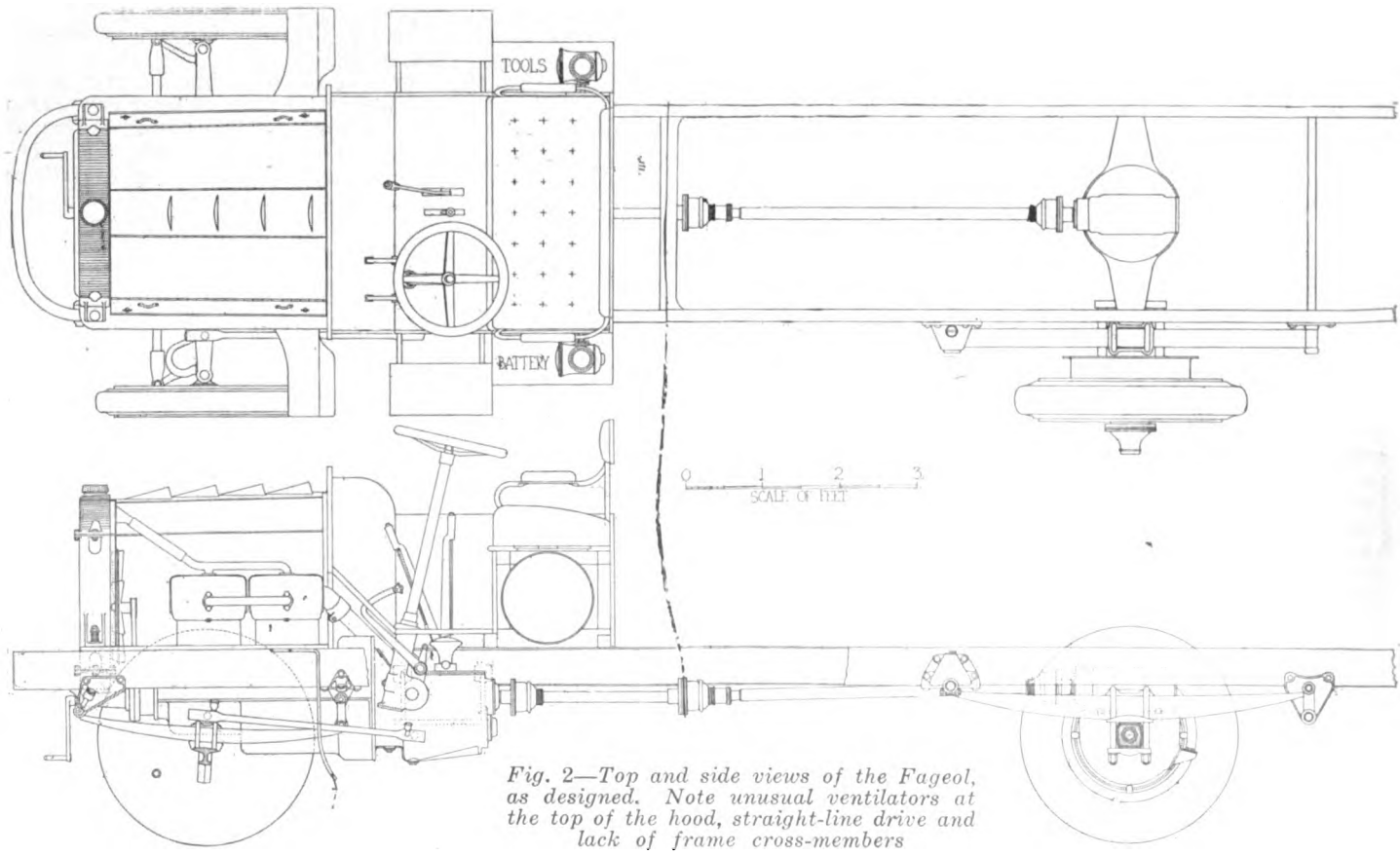
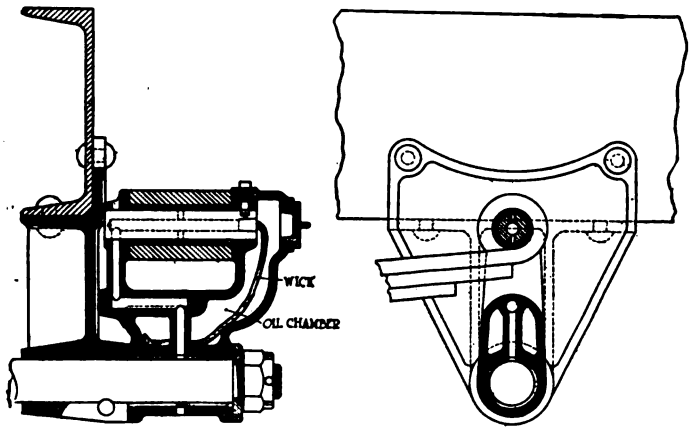
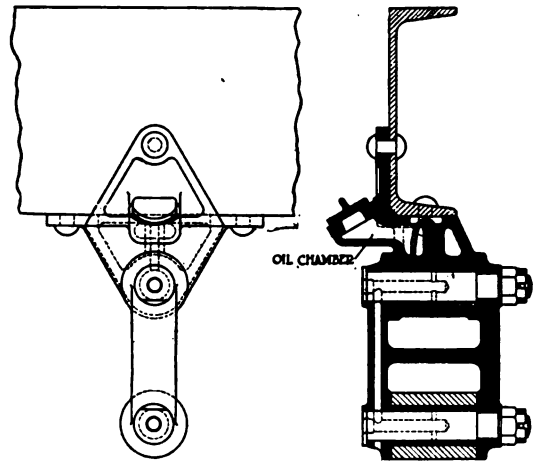


Fig. 2—Top and side views of the Fageol, as designed. Note unusual ventilators at the top of the hood, straight-line drive and lack of frame cross-members

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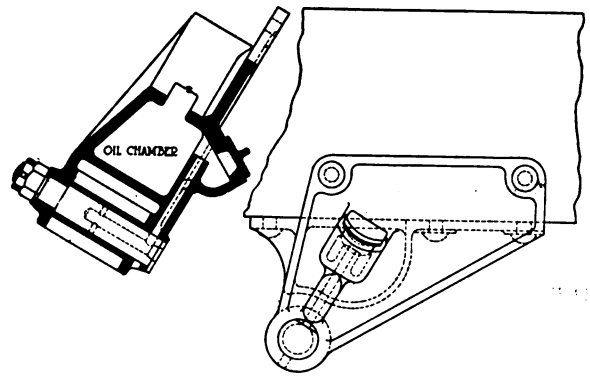


Fig. 3—Rear spring shackle, showing oil chamber, hollow links and method of distributing oil over working surfaces

Fig. 4—To the right, above—Front spring shackle, showing reservoir at the top instead of at the bottom

Fig. 5—Front spring pin and bracket, with wick removed

exactly how long these reservoirs will serve before replenishment is necessary without actual experimentation, it is reasonable to suppose that the time can be measured in weeks or even months instead of days as with grease—or oil-cup lubrication. Each reservoir serves the entire member of which it is a part, so that the number of points requiring attention is enormously reduced.

Aside from this feature the truck is interesting in the high degree of flexibility apparent in its design, the frame being possessed of the minimum of cross-members, the whole power plant being on three points and in one rigid assembly and the unusually-long rear springs being used to take torque and propulsion.

A 5-ton Fageol incorporating features similar to this 2-ton model, especially in the spring-bolt lubrication scheme, is shortly to be placed upon the market. It will likewise have a flexible frame and worm drive.



Packard 5-tonner with new twelve-cylinder airplane engine, being tested on the aviation field

Packard Aero Engine Is Tested on Truck

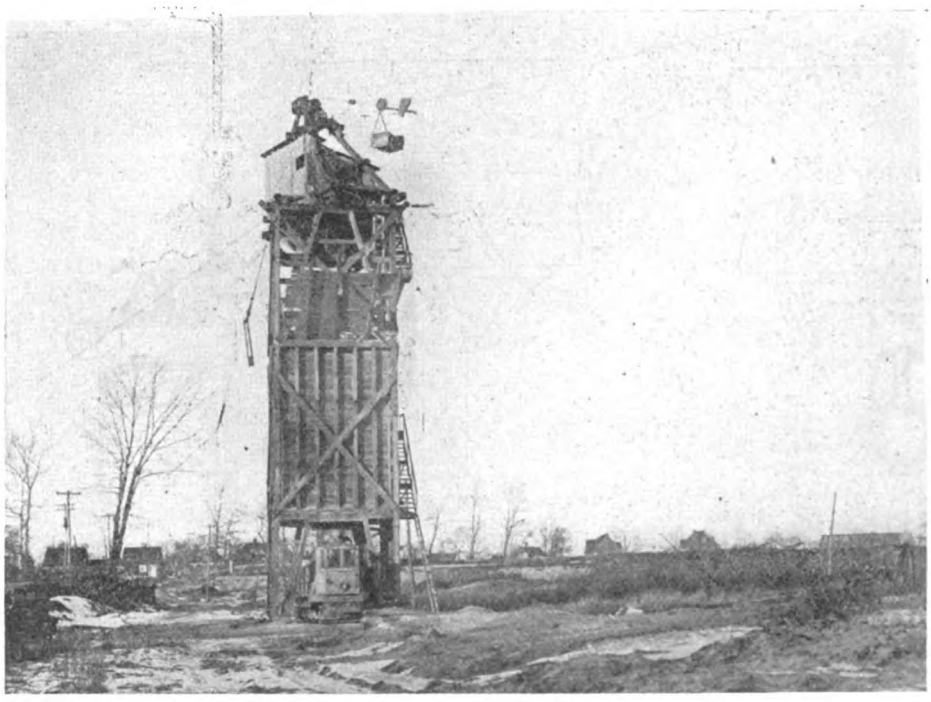
MOVES 5-TONNER THROUGH SNOW BY THRUST OF ITS PROPELLER

TESTING an aviation engine by having it drive a 5-ton truck may not seem very conclusive at first blush; but when done as it recently was by the Packard Motor Car Co., Detroit, it represents a very thorough and strenuous ordeal. The engine tested is the new twelve-cylinder aviation engine which the Packard company has developed. In order to try out its ability under a load which is adaptable to fairly accurate determination, the big 200-hp. engine was mounted on the load platform of a 5-ton worm-driven Packard truck with the propeller located aft.

A Packard truck radiator was mounted on staging in front of the engine and the truck motor stopped and thrown out of gear. By the aerial thrust of the propeller alone the engine was able to drive the truck at a high rate of speed—40 miles per hour, it is understood. The run was made on the snow-covered aviation field recently acquired by Henry B. Joy. A further and still more difficult task was imposed when the wheels of the truck were locked and the engine made to drive the truck with the wheels sliding over the snow.

A portion of the test was run over Detroit streets; but the fierce breeze and the un-muffled exhaust caused the police to bar it after a brief sally.

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Sand pits at Burnside, 4½ miles from Hartford, showing ¾-yard scoop filling hopper and trolley car being loaded

Rapid Lading Means and Good Records Permit Fair Zone Charges

In Service of Nutmeg Building Material Company

QUICK loading and unloading, the use of one type and make of truck and a scale of graduated delivery prices are features of the truck service of the Hartford Sand & Stone Co., Hartford, Conn. This concern, a leader in its line, is operating at present four Saurer 5-ton trucks. Four chain-driven Macks have been ordered for early delivery and two of these will replace as many Saurers while the other two will make a 50 per cent extension of service.

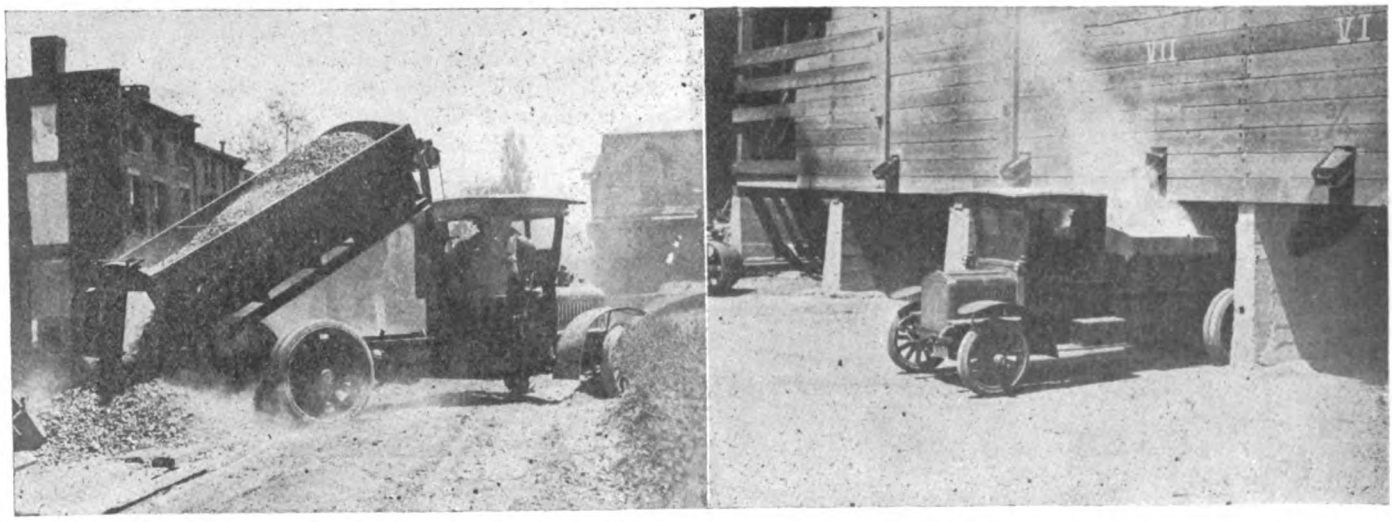
The business of the Hartford Sand & Stone company as the name would imply is the sale of sand and stone. For both of these products there is a big demand in Hartford and surrounding country; in fact it has developed a considerable industry. The Hartford Sand & Stone company transacts in the course of 12 months a sizable volume of business. And to handle it there is a good equipment.

Loading of trucks is by gravity. The sand and stone yards of the company are situated at Warner Street extension, 1.3 miles from the center of the city, which is approached by either of two well-paved roads. The building in which the pits are located is oblong in formation and to all intents and purposes three stories high. The upper level, if such it can be considered, is taken up by trolley tracks; the intermediate level is given up to the pits proper, while the ground floor is for the truck stalls. There are nine of these stalls under as many sand and stone pits. For instance, four of these pits are for sand and five of them for stone, which is binned according to size; that is, ½ inch, ¾ inch and so on. Most of the stone handled is used in concrete work and is therefore of medium size.

When a truck is to be loaded it is backed or run into one of the stalls. The driver pulls a lever which opens a chute and permits the stone or sand to feed into the truck body. There are chutes within and without the building. The stalls are formed by the concrete supporting walls of the building, which extend the full width of the structure. The chutes referred to permit of quick loading, as two of them can be worked at once.

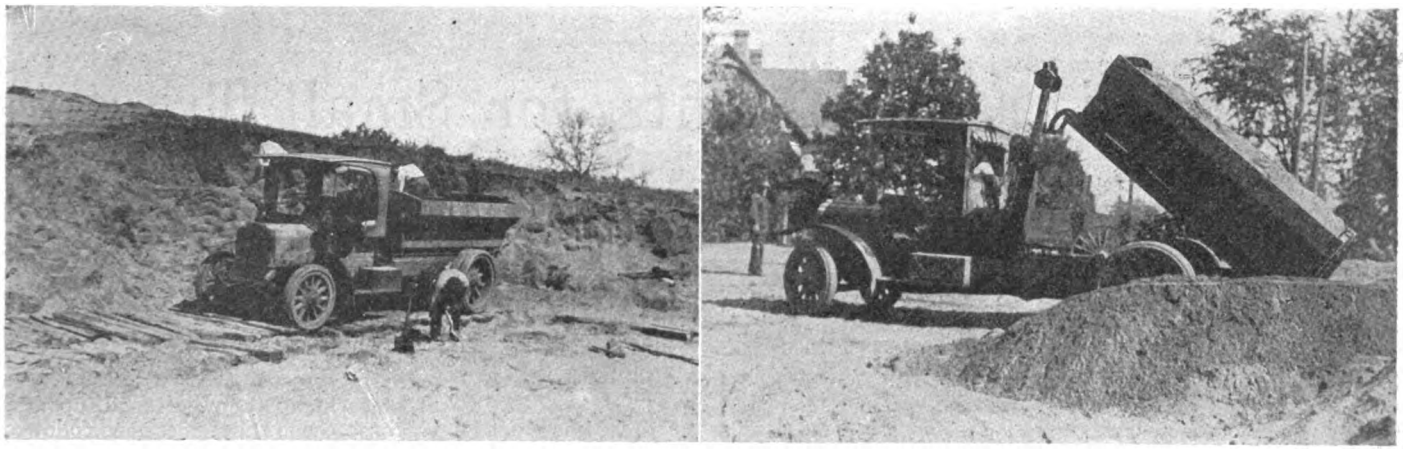
One of the company's holdings is a sizable tract of sand in Burnside, about 5 miles from Hartford. The run from Hartford to this point is over good roads. There is a tall gravity loader which is supplied with sand by a steel scoop holding ¾ cu. yd. of sand. This scoop operates on a heavy steel cable extending from the loader to the sand pits. Travel back and forth is induced by an electric motor attached to a suitable gear. The operator has only to trip the scoop to allow the load to pass below.

Cost of commodities handled by the company is governed by the length of the haul. There is a graduated scale of prices ranging from $1.10 to $1.90 per ton for crushed stone and $1.30 to $1.70 per cubic yard for sand. Five tons of stone delivered, say, 3½ miles from the yards to the city line will cost the consumer $9.50, which means 1 carload. If he were near the yards the same material would cost $5.50. Stone is sold by the net ton and sand by the cubic yard. Five tons of stone or 4 cu. yd. constitute a full load. When the writer commented on this scale of prices the reason given for it was that the margin of prof-



Truck loading stone at the hoppers, right; and dumping its load on the job, at the left

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In the rush season the truck is loaded directly from the pits, left; and dumped as usual

it is very small as compared with coal, for instance, which costs the consumer no more if delivered 4 miles from the yards than if delivered but a half mile away.

There are eight months in the year in which the Hartford Sand & Stone company may anticipate a profit, or in other words the open months when the building trade is brisk. Practically all of the company's output is used in the building trade. The exception is road work. Obviously winter is a hard time of year in this particular kind of business.

At the Burnside sand pits trolley cars are loaded and sent to Hartford. This is the practice at all times, and as a rule the trolleys can keep pace with the demand. Last summer, however, such was not the case, for the company had a large contract with a paving concern operating a portable plant at Dutch Point. On this occasion the Saurers hauled the sand from Burnside loaded by hand to the paving plant, a distance of 4½ miles.

There is one peculiar advantage in the trolley system. Deliveries can be made to certain points along the trackage in sizable loads at one time. However, as in every kind of work the exception is found in the ability of the truck to get where the trolley cannot and to give direct delivery.

One type of flareboard body is used on all the Hartford Sand & Stone company's trucks. All are painted yellow, kept clean and not overloaded. Each is fitted with a hydraulic hoist so that on arriving at the point of load disposal discharge is prompt. Little time is required for loading because of the gravity feeders, so that time of operation is simplified at both ends. The Hartford Sand & Stone company service is a one-way one; that is, load is carried on the out trip only.

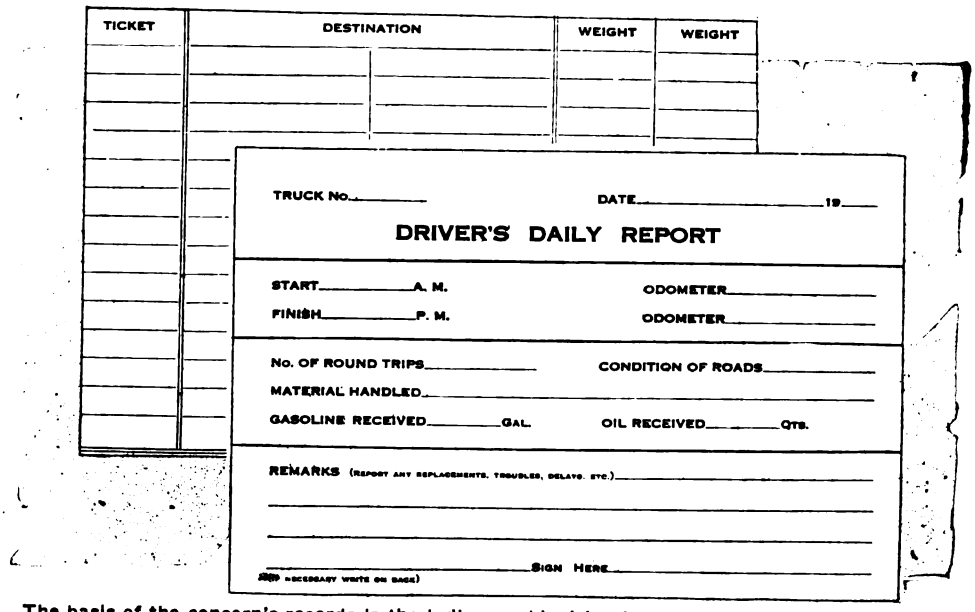
As each driver leaves the yard he drives onto the scales. The load is weighed and he is given a slip showing the weight. For sand he is given a pale-blue slip, and for stone he is given an orange one. Either slip is issued in triplicate, one copy for office record, original for customer's signature to be returned to the office and one for the records.

The worth of the signature system has been emphasized many times; not that customers of the firm would avoid payment, but that under press of other matters they had forgotten just how much sand or stone they did get and sign for.

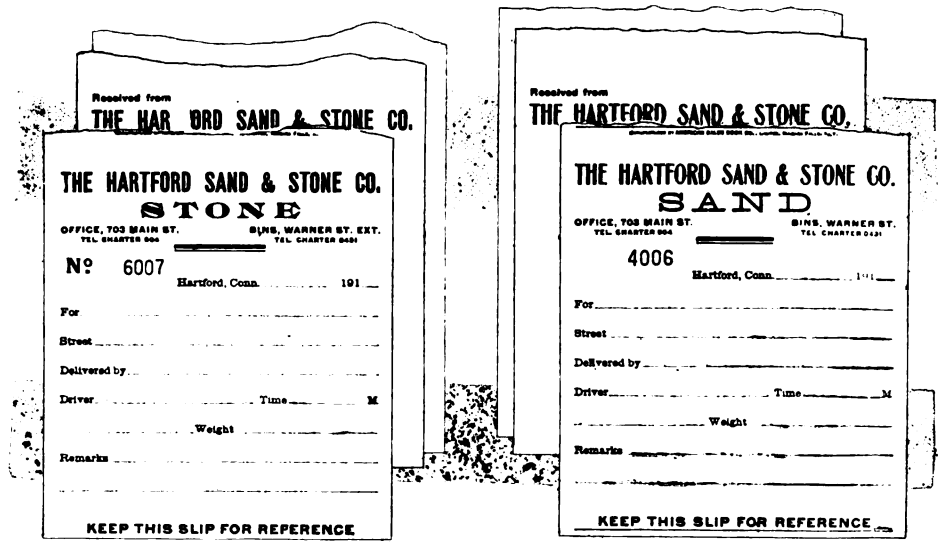
Officials of the Hartford Sand & Stone company were not inclined to discuss operating costs or let any light in on the subject other than to suggest that $20 a day would cover them. Depreciation is charged off at 20 per cent, though there is an idea here it should be 25 per cent or a shade more in fact.

The company has its own garage, a

(*Continued on page* 27)



The basis of the concern's records is the indispensable driver's daily report, back and front faces of which are shown



Triplicate records kept of each delivery. To the left are the stone slips, on salmon-colored paper; to the right the sand slips on light blue stock. Each copy bears the serial number

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New Semi-trailer Outfits for Small Tractors

New Rear System Permits Rehabilitation of Horse Wagons—Dumping and Extension Types

SEMI-TRAILERS for use in connection with light touring cars or trucks, employing the Martin fifth wheel are made in several types by the Martin Rocking Fifth Wheel Co., Springfield, Mass. To its line of standard express types, the Martin company has recently added a new extension lumber trailer and a balanced dumping type and a trailer rear system to replace the rear portions of a horse wagon converted for trailer application.

The latter outfit is used in this way: When converting horse wagons for use as trailers, the first step is usually to fit the Martin fifth wheel to the forward end of the wagon in place of the regular fifth wheel used for the front wheels, the rear deck of the motor vehicle replacing the front wheels and horses. In Fig. 1 is shown a Ford chassis with a special Tractor model of Smith Form-A-Truck, attached to an old horse dray by means of the Martin fifth wheel.

The wagon so used will probably serve for a year, more or less, dependent upon its condition, before the excess of speed over that for which it was designed causes the rear system to fail. It may be that only the wheel boxes will give out; perhaps the wheels themselves will have to be replaced; the springs may give way, or the axle may prove unfit. In this case the wagon body and frame will usually be found to be in good condition.

To avoid having to discard the good portions of the wagon, the Martin trailer rear system is provided. This consists of a pair of strong wheels with inclosed Bower bearings on a heavy axle, a pair of heavy half-elliptic springs and two spring brackets, as shown in Fig. 2.

The wheels are of 36-inch diameter and fitted with demountable solid rubber truck tires, and a pair of pressed-steel bolsters on which the four spring brackets are bolted and which in turn bolt to the bottom of the wagon bed. Owing to the use of lower wheels, made necessary in order to fit standard rubber tires, it is necessary to use the bolsters to prop the body up to its normal height, so that the load platform is the standard 42 inches above the ground.

The springs are pinned at their fronts and rest against a friction plate at the rear, eliminating shackles and lubrication at this point. If a lower load platform than standard is desired, special low bolsters or none at all may be used. With this unit applied to an old horse wagon, the latter is converted into a serviceable trailer, running on rubber tires and with bearings designed for high speeds and continuous running.

The outfit is made in three sizes, rated at 3, 6 and 10 tons, although these ratings will vary somewhat with the amount of load which is allowed to fall upon the tractor. General specifications follow:

Capacity, lbs.	6,000	12,000	20,000
Price, complete	$250	.....	.....
Tires	36x4	36x5	36x6
Track or gage	56	58	60
Maximum width	72	72	72
Spring centers	40	42	44
Spring length	46	48	50

Variable Wheelbase Model

Similar in some respects to the standard types of lumber gears used for horse haulage, but with some improvements which especially adapt them to motor service and speeds, the Martin extension reach trailer, as it is called, comprises a two-wheeled trailer carrying a hound in which telescopes an extension reach, carrying the Martin rocking fifth wheel at its front end. It is shown in Fig. 3.

This element, while called a reach for convenience, is not such in reality, for a reach properly connects axles, whereas this extension is entirely above the springs. It is in this feature wherein the trailer is superior for motor service to the standard lumber gear, for, being sprung, the vibration on the reach is much reduced and its tendency to bow and to multiply the vibrations to the detriment of the trailer gear and the tractor.

The front end of the reach also car-

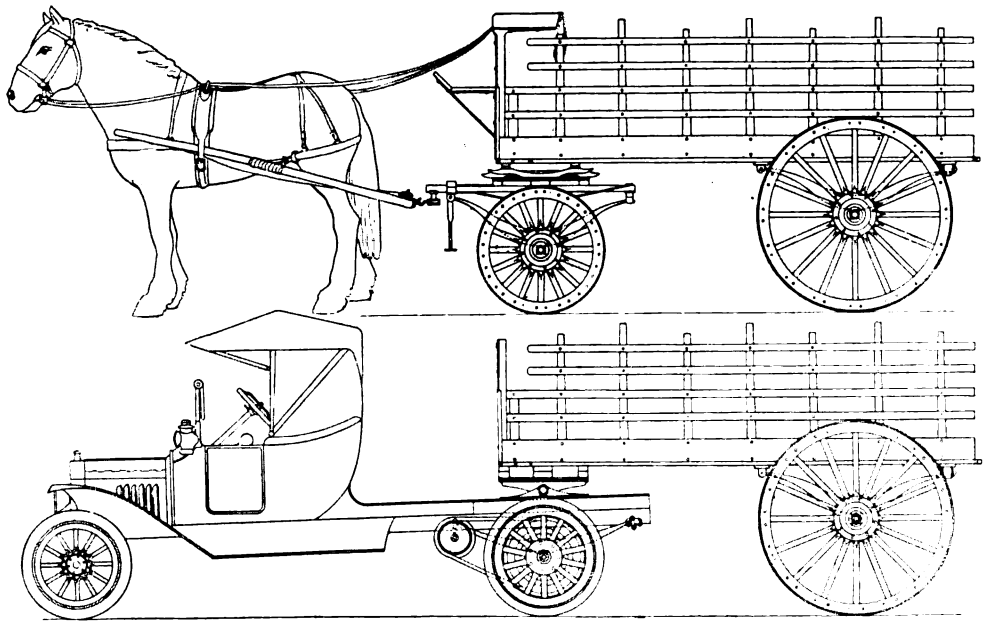


Fig. 1—At top, the horse wagon. Below, adapted to trailer use by substituting an adapted Ford for the horse. The wagon body will stand up indefinitely, but the gear will not

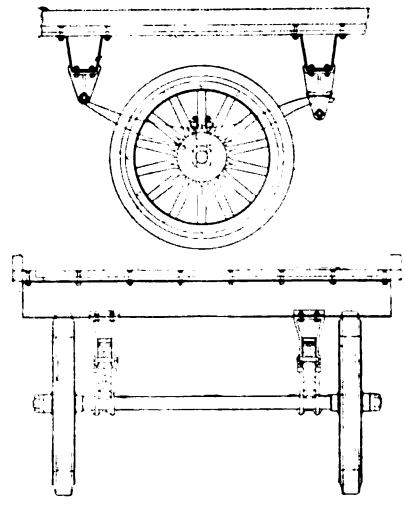


Fig. 2—Martin rear system which replaces the more vulnerable parts of the horse wagon at small cost

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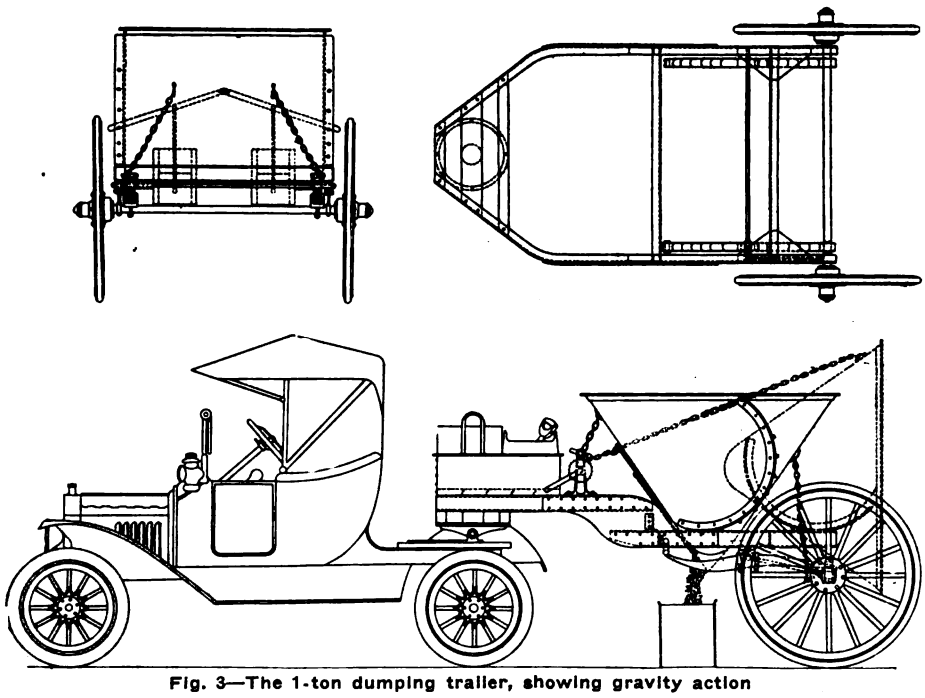


Fig. 3—The 1-ton dumping trailer, showing gravity action

ries a small platform at the top, carrying four stakes with rings for ropes. Similarly four stakes are provided at the rear. At the front end of the hound is a loose pin which registers optionally with a series of holes drilled in the reach, this permitting the wheelbase of the trailer and its load length capacity to be varied at will.

The rear system comprises a set of three-quarter-platform springs of the orthodox cupid's-bow type, underslung beneath a rectangular axle with bronze-boxed wood wheels carrying rubber tires. The trailer is rated at 1 ton capacity and sells for $195 complete with the fifth wheel.

Simple Dumping Type

Designed especially for coal but adapted to the haulage of similar material, the dump trailer resembles municipal ash carts to some extent, the body proper being a steel hopper of wedge shape, set with one edge downward, across the frame. There are two wheels, with Bower roller bearings, rubber tires and an axle, at the extreme rear, attached to the frame through cantilever springs pivoted to a channel-steel frame. This frame is of the dropped pattern, the drop being just in front of the body and formed by a wide plate riveted to the front and rear channel section of the frame. At the front is a Martin fifth wheel, surmounted by a small box in which coal bags, shovels, etc., may be carried. The frame is of exceptional width at the rear, but curves inward toward the front as may be seen in Fig 4.

At the triangular sides of the body are semi-circular rockers, provided with dowel pins which register with holes in a plate on the frame on which the rockers bear.

When in the upright or carrying position, the distribution of weight is such that it is nearly balanced and the body is placed sufficiently in advance of the rear axle to provide the correct distribution of load between the trailer wheels and the tractor. A chain, attached to the front end of the body and wound about a ratchet hand winch serves to retain it in this position, a pair of chains attached to the back being drawn taut when this winch is wound up, thus retaining the body rigidly in place so that it does not thrash about or rattle.

The dumping action is controlled by the ratchet dog. Pressing down on a lever raises this dog and permits the body to overbalance, rocking back and tilting over the back, the front chain preventing it from tilting too far. By virtue of its wedge shape, the angle of the back side in the dumping position is such as to insure rapid discharge, even of such a substance as asphalt and the height of the edge of the body is quite close to the ground—18 inches.

With the load discharged, the body is easily rolled back to its upright position by means of the winch. The discharge may be controlled by using the crank to ease the body down to any desired angle.

When bagged coal is to be delivered, the bags may be filled through small chute doors at the bottom. There are two of these, one at either side, controlled by long levers, conveniently placed. This trailer, too, has a capacity for 1 ton. It sells for $290 complete with the fifth wheel.

Rapid Lading Means

(*Continued from page* 25.)

one-story brick affair, which, if not ornate, serves the purpose very well. The vehicles are kept in this building. There is a concrete floor which is pitched toward the wash basin over which there is a vehicle washer. Judging from the appearance of the fleet, good use is made of the washer. There is equipment for making repairs, though it is said the trucks are never laid up long for this reason. One of the drivers who is a mechanic looks to keeping the cars in order. The fact that all vehicles are of the same make and type has been of help to the company. And speaking of repairs it is said that stone dust and sand do not seem to have any particular deleterious effect upon the chains, which are fully exposed.

Among the holdings of the company is a stone quarry in Farmington. This is about 8 miles from Hartford with a well-paved road all the way. However, very little hauling is done from this point by truck. Practically all the stone is brought to the Warner Street bins by trolley.

Each driver reports on a special card, 4 by 6 in., the work of the day. The front side of the card provides space for the truck number, the date, odometer reading at the beginning and close of day, number of round trips, condition of roads, material handled and fuel and oil used. There is also space for remarks. The driver signs the card. On the reverse side of the card is space for noting trips. The average day's work is 8 trips all over the city. Fifteen trips is about the highest number recorded. The trucks work every week-day in the year and lose little time for repairs. The officials say nothing but a blizzard stops the trucks.

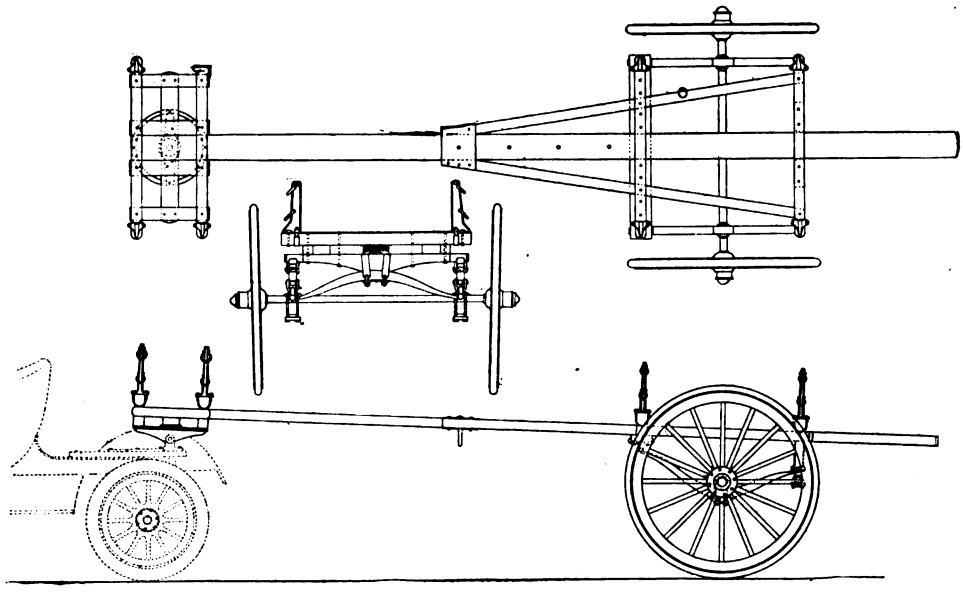


Fig. 4—Extension reach trailer for hauling lumber, etc.

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MILEAGE EFFECT OF OVER-TIRING

How Mileages Have Been Increased By Increasing Tire Sizes

To the Editor, COMMERCIAL VEHICLE:

While no one can reasonably doubt that the fitting of larger tires than standard does increase the mileage to be gotten out of them, I have often wondered just what increase can be obtained. Your articles on the effect of the general practice of fitting over-sized tires to trucks as a means of inducing the overloading of trucks have interested me extremely, but I believe that before the practice should be discouraged its effect upon tire economics should be examined minutely to discover, if possible, whether the use of larger tires under normal truck loads is or is not really economical.—H. C. MERRILL, Cleveland.

The question is: Do over-sized tires increase mileage sufficiently to cause a lower cost per tire-mile, or is the net result the same? As answer to this question nothing can be more convincing than actual records of users who have tried it. THE COMMERCIAL VEHICLE acknowledges its indebtedness to *India Rubber World* for the figures on this subject appearing in the table on this page.

The names of these concerns are on file, and from the nature of their experiences it would appear that the original equipment in many instances had been too small or else that the trucks, both before and after the change in sizes, were seriously overloaded.

Devoted to topics pertinent to commercial vehicle operation design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

For example, Firm A, which had only received 3800 miles from 36 by 4 duals, in fitting 36 by 5 duals only received the 8000 miles, which is normal, which proves little, because naturally tires so habitually abused as these must have been would wear out of all proportion to the life to be expected when properly applied. The same remark applies to a greater or less degree to all of the other firms, as far as rear tires are concerned, and to all but G and H on the fronts. It is from the latter firms that our lesson must be drawn. Here we see that these, with their normal 1000-mile excess over the guarantee, were satisfied and did not change tires.

On the other hand, conclusions are not so easily drawn in the cases of C, D, E and the second truck of H. Here tire equipments which previously yielded abnormally low mileages were made to produce unusually high ones, for which the most natural explanation is that the former tires were of the proper size, but were abused by improper methods of operation, the oversized tires, later applied, giving extraordinary mileages notwithstanding.

TABLE SHOWING TIRE MILEAGE INCREASES DUE TO OVERSIZED TIRES

Firm	Wheel	Original Equipment Size	Original Equipment Mileage	Oversize Equipment Size	Oversize Equipment Mileage	Mileage Gain
A	Front	34 x 4	5,500	34 x 5	8,000	2,500
	Rear	36 x 4d	3,800	36 x 5d	8,000	4,200
B	Front	34 x 3½	2,500	34 x 4	8,500	6,000
	Rear	34 x 3½d	2,500	34 x 4d	9,000	6,500
C	Front	36 x 4	5,000	36 x 5	8,000	3,000
	Rear	36 x 4d	5,000	36 x 5d	11,000	6,000
C	Front	36 x 4	5,000	36 x 6	11,500	6,500
	Rear	40 x 4d	4,600	40 x 5d	11,500	6,900
D	Front	34 x 4	5,500	34 x 5	8,000	2,500
	Rear	36 x 4d	4,500	36 x 5d	10,000	5,500
E	Front	34 x 4	5,500	34 x 5	8,000	2,500
	Rear	36 x 4d	4,500	36 x 5d	10,000	5,500
F	Front	34 x4	6,000	34 x 5	8,000	2,000
	Rear	36 x 4d	5,000	36 x 5d	9,000	4,000
G	Front	36 x 5	8,000	36 x 5	8,000	....
	Rear	40 x 4d	4,000	42 x 5d	9,500	5,500
H	Front	36 x 5	8,000	36 x 5	8,000	....
	Rear	40 x 4d	4,000	42 x 5d	8,500	4,500
H	Front	34 x 4	5,500	34 x 5	11,000	5,500
	Rear	36 x 4d	5,000	36 x 5d	11,000	6,000
I	Front	34 x 4	5,000	34 x 5	8,800	3,800
	Rear	36 x 4d	4,000	36 x 5d	9,000	5,000
J	Front	....	....	....	....	....
	Rear	40 x 4d	4,000	42 x 5d	9,000	5,000
K	Front	34 x 4	4,000	34 x 5	8,000	4,000
	Rear	36 x 4d	4,500	36 x 5d	8,000	3,500
L	Front	....	....	....	....	....
	Rear	42 x 6d	3,500	42 x 7d	8,000	4,500

WHICH WAY DO TANKS RUN?

Wheels on Tanks Trail—Steering Is By Clutch Control

To the Editor, COMMERCIAL VEHICLE:

Everyone is interested in the British tanks, but so far as I have been able to find, there has been nothing in the American press so far which gave one anything like a clear understanding of how they work. Every writer seems to have his own idea of the reasons for their peculiar design, and there does not seem even to be any agreement as to the direction in which they run. Perhaps THE COMMERCIAL VEHICLE can throw some light.—L. N. HARDY, Buffalo.

A brief explanation of the operation of the tanks was published on page 11 of the Dec. 15, 1916, issue of THE COMMERCIAL VEHICLE, beneath a pair of views of one of these death-engines in action in France. To amplify those brief notes it should first be understood that the wheels on the tank are merely an appendage for increasing the effective wheelbase and, contrary to the usual opinion, are not used as the steering means. They trail the tank and carry next to none of the load under normal running conditions.

Fig. 3 represents a tank negotiating a trench or shell-crater. At the left it is just starting to cross. In the middle it is half-way across, showing how the wheels act as an additional supporting means, without which the tank would have to go down into the hole and climb out again. At the right, it is shown almost across, with the wheels hanging in midair.

Next, it should be understood that the principal feature of their construction, which enables the tanks to negotiate ground practically impassable to any other vehicle or even to beasts of burden is the caterpillar or track-laying lagbeds. These consist of endless steel belts which lie flat on the ground and upon which rest the vehicle wheels, of which there is a multiplicity. This endless chain acts as a track, being laid flat under the wheels and being picked up again after they have passed over it.

Because of their great area of contact and their conformation to a greater or less extent to the contour of the ground, they provide practically non-slipping traction and support the great weight of the tractor even on very soft

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ground. The drive is by means of sprockets within the belts, so that a positive drive is effected, thus insuring traction under practically any road condition.

In the tank the shape of the lag-beds has been carried out in a very different manner from that used on their farm tractor predecessors. Instead of being low and flat, these are strung over great steel frames which must be much higher than a man—possibly 10 to 12 feet. This not only provides a high wall of armor and brings the top portion of the track high enough to be protected against attack from the ground, but it permits the tank to possess the astonishing climbing ability of which we see so much in the war reports.

How this is effected is revealed by a study of Fig. 2. The most striking thing about the shape of the tank is the sloping underside of the front ends of each lag-bed. This is the key to the effectiveness and agility of these colossal juggernauts. The slope on this portion of the traction belt is equal to a segment of a brobdignagian wheel, such as some of our visionary popular technical magazines have suggested.

The value of a wheel as a traction means is due to its action as a lever, the larger the wheel the longer the lever. Only that portion of the wheel which is first in contact with the ground acts as a lever, however, and it is just this portion and no other that is reproduced in the tank.

In Fig. 2 the tank is shown negotiating a sharp bluff from a dead level. The ease with which it does so is explained by the dotted line suggesting the circumference of a wheel whose angle of incidence would be the same as that of the tank's front end. On a perfectly smooth plane a large wheel has practically no advantage over a smaller one, but the greater the obstacle which is to be surmounted the larger the required size of wheel.

At the top of Fig. 2 is shown in Fig. 1 an armored car, built upon a truck or car chassis with ordinary-sized wheels, attempting to climb the same bluff with obvious non-success.

The apparent reversal of this slant at the rear is for the purpose of extending the ground contact surface as far as possible to the rear, bringing the belt forward again in as short a distance as possible to save length of belting and weight. The whole *ensemble* leaves a fair-sized space at the middle for the accommodation of the crew, the guns and the ammunition, as shown by the extending turrets at the sides.

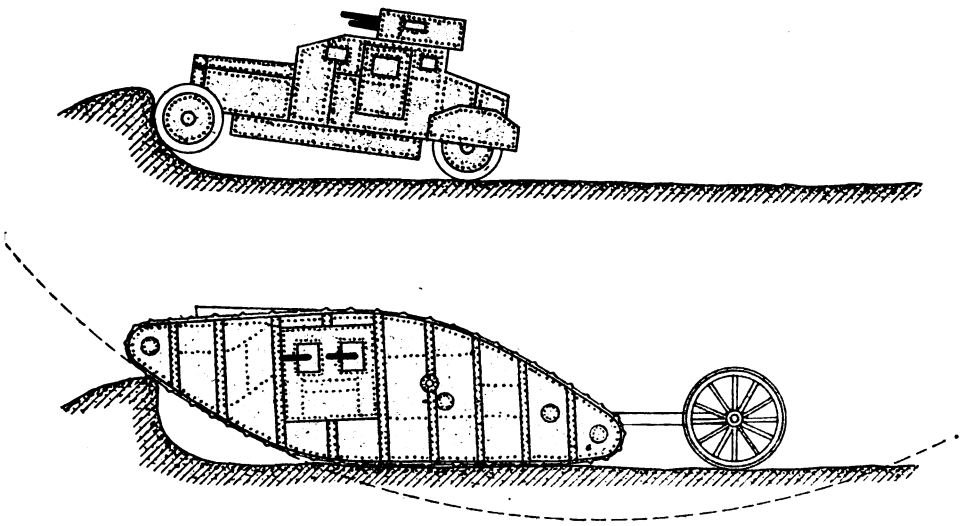


Fig. 1—Above—Illustration of the limitations of the wheeled armored car in negotiating un-roaded country

Fig. 2—Below—How the tank negotiates such country without difficulty. Note broken line, representing the circumference of an equivalent wheel

So much can be determined from a study of the exterior of the tank. So far as is known, nothing has yet leaked out on this side of the Atlantic as to the interior construction of the monsters, but it is practically certain that at the extreme front and rear of the lag-beds are sets of sprockets on which the belts run, and it is highly probable that the rear ones do the driving. There are probably trucks to support the weight on the lower sections of the belts and possibly light rollers all around the side sections for the belts to run on.

TRUCK SERVICE CONTRACTS

How Fixed-sum Maintenance Arrangements Are Made With Owners

To the Editor, COMMERCIAL VEHICLE:

There is circulating through the eastern states, especially St. Louis, a truck service proposition, that is, where a service station or garage contracts with a truck owner to store and maintain his trucks through ordinary wear at a minimum expense of say $20 to $30. Would appreciate it very much if you could advise us how to get ahold of garages giving this kind of service so that we may get a line on this proposition ourselves. —W. F. SCHREIBER, manager, General Auto Service Co., Kansas City, Mo.

THE COMMERCIAL VEHICLE knows of no such campaign in that particular part of "the eastern states" which centers about St. Louis, but from the description given it would appear that from the standpoint of the garage or service station an arrangement whereby the owner is to pay a *minimum* of $20 to $30 for maintenance and repairs, including storage, and no *maximum* stated, should be an excellent thing; but it is to be feared that from the all-important viewpoint of the owner, the proposal has little attraction.

Flat-rate maintenance service assumes many forms, but as a rule any such scheme is unsuccessful unless the service concern has a certain amount of control over the use of the vehicle. If the owner is permitted to take his vehicle out in the morning and bring it back at night, doing with it what he wishes during the day and then holding the service company to deliver it to him in perfect mechanical condition each morning, it is little short of ruinous to the service contractor. The owner is free to overload the truck, to overspeed it and to abuse it in every way. If the charges are anywhere near correct, then the most careful of a number of users of such a service would pay for more service than he

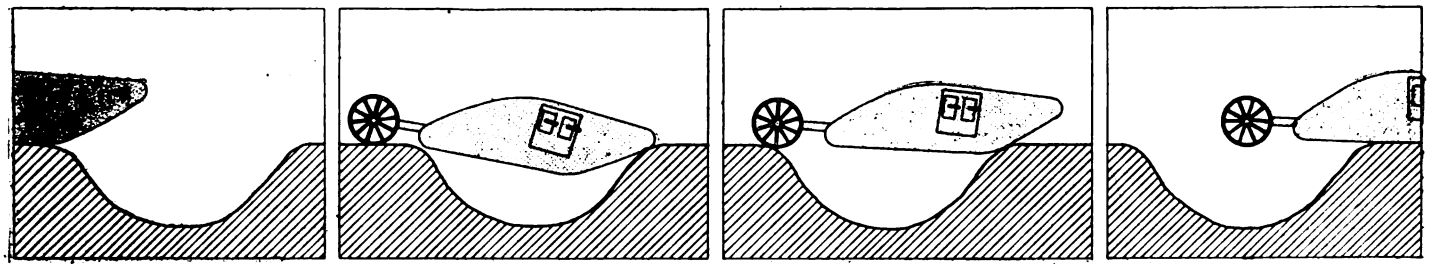


Fig. 3—How the tank crosses trenches and shell-craters, showing utility of the trailing wheels

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was getting and the one who neglected his truck and abused it the most would be getting more than he paid for at the expense of the others.

Furthermore, such a scheme would be very unsatisfactory to the user unless he had some guarantee of service. To determine in advance what maintenance will cost is not enough. He must be assured that the truck will be ready for service every morning or that a substitute truck of equal capacity is available for his use.

One of the most attractive arrangements of this sort was for some time in operation in New York City. The Federal Operating Corp. operated a service station and garage under contracts with users by which they were relieved of all worry and responsibility for maintenance. There were three plans:

1—Mileage basis. Under this scheme the owner purchased a new truck, which he turned over to the Federal concern, which agreed to pay all running expenses, supply the driver and buy the supplies at a flat rate per mile run. It guaranteed service every working day and the rate was adjusted according to the mileage run. The owner paid the fixed charges of interest, depreciation, licenses and insurance and a per-mileage maintenance charge. If the truck was run overtime, no extra charge was made, save that where there might be an excessive amount of overtime a somewhat higher rate would be charged. A minimum charge for 20 miles was exacted every day, whether the truck was operated or not.

2—Hour basis. If the user preferred, a flat rate of so much per day for any mileage that was made was charged under the same conditions as above.

3—Rental basis. In case the user did not wish to own the trucks, preferring to try out their service for a year or so before venturing the investment, the operating corporation bought the trucks for him, whatever make he preferred, and rented them at either a mileage or hourly rate, as above, except of course that the rate was higher. The user had the privilege of buying the truck at its book value at the end of the contract, or of renewing the contract at the company's option.

4—Percentage basis. This method was generally employed in the case of a user who already owned trucks and wished someone else to operate them. Under this plan the corporation charged a certain percentage of the operating costs of all kinds as its fee. The user was privileged in this case to vise the records at any time, if he thought the service station was boosting the cost to inflate the percentage margin. In spite of this apparent weakness, the scheme was popular, since it gave the advantages of guaranteed service, fleet maintenance, with skilled mechanics instead of tired drivers to look after the truck, buying at wholesale prices instead of retail, better access to the right sort of labor such as drivers, stitch-in-time inspection and repair, saving big repairs and supervision by expert specialists, saving worry.

Despite its manifold advantages, this business was abandoned.

Space forbids dilation on the many ramifications of the subject, but from the experience of the many plans and attempts to provide the small owner with the advantages of fleet service it is evident that owners in general are not ready for it and that it is not an easy enterprise to handle.

42 IN. STANDARD FLOOR HEIGHT

Much Variation, but This Is the Average for Medium to Heavy Sizes

To the Editor, COMMERCIAL VEHICLE:

Will you kindly advise us if there is a standard height adopted by the truck manufacturers as to the distance from the ground level to the bed of a truck? If there is no standard for this measure, can you tell us what this measure will average? Our object in asking you this question is that we are setting a platform and first-floor sheds on a new building which we are constructing and wish to arrange same so that the loading platform will be placed at the proper height for average trucks.—J. C. SINCLEAR, Speakman Supply & Pipe Co., Wilmington, Del.

Load platform height has never been standardized, due to a number of causes which were formerly stronger deterrents than they are to-day. Formerly vehicle construction varied so greatly and wheel sizes were so various that little could be hoped for in this direction. The load platform height for horse wagons, however, has long been 42 in. as a standard. The average measurement for trucks now in use is 42 in., eliminating the lighter capacities, which usually have their bodies set between the wheels, and therefore lower.

INSURANCE FIRM SHOULD PAY

Moving Man May Demand Payment for Goods Burned on Truck

To the Editor, COMMERCIAL VEHICLE:

I wish to inquire if there is any case you know of that has been decided under the conditions similar to the following:

I have insured a Mack truck under a valued fire and theft policy in the N—— Fire Insurance Co., the truck being insured for a specific amount, and to the policy is attached an indorsement reading as follows:

"In consideration of $—— additional premium, this policy is extended to cover for the sum of $1,000 on legal liability of the assured for loss or damage to merchandise by fire while contained in the automobile herein described. In the event of loss this company shall not be liable for more than the actual value of such property at the time of loss."

The car insured burned up, also the furniture in the car, while delivering furniture for a man moving from one location to another. The company promptly paid loss on the automobile, but contended that it was not liable for the loss on the furniture.

I might add that I advertise and do make an agreement with each person for whom I move furniture to the effect that I cover his furniture against loss by fire up to $1,000 and will be liable only for that amount.

As the owner of the furniture is contemplating suing me and the company is refusing to pay me, I would appreciate very much your advices in the matter.—A. W. GROVENGER, Albany, N. Y.

Precedent no doubt exists in the court records from which one might derive assistance, but a search of the records is more properly the work of a lawyer than a magazine. From the merits of the case, however, it seems clear that unless there are some pertinent points not covered in the above outline of the case the insurance company is liable for the amount of the loss in furniture up to $1,000 in value; but whether the insurance company is or is not liable, Mr. Grovenger is unquestionably obligated by his guarantee and the obligation expressed in his advertisements to reimburse the owner of the furniture up to a like amount.

The only question which seems to suggest itself as a possible reason for the action of the insurance company is a doubt on its part of Mr. Grovenger's liability, for which reason it would be well, if he has not already done so, for him to submit proof of such liability in the form of a copy of the agreement or guarantee and a proof of one of the advertisements referred to.

W. I. Payne, chairman of the insurance committee of the Motor Truck Club of America, 1790 Broadway, New York City, may be appealed to for aid in this case, his services in such office being rendered without charge.

To hold up payment of the amount due the innocent victim of the fire will avail nothing, and Mr. Grovenger's case with the insurance company will only be strengthened by a settlement of that claim forthwith.

"Bearing on Bearings" is the title of a twenty-four-page booklet just issued by the Gurney Ball Bearing Co., Jamestown, N. Y., in which the savings effected by the use of ball bearings instead of plain bearings in several factory installations are interestingly recorded. War on waste is the pertinent sentence on the book's title page. It is divided into five short stories, the first dealing with the saving in power obtained by mounting pulley shafting on ball bearings in a certain plant; the second on grinding, polishing and buffing machines; the third of the saving effected by mounting on ball bearings the small hand-pushed transveyor trucks; the fourth of an installation in a wood-shaping machine; and the fifth of a similar saving made on a sawdust fan. These stories are simply told in an interesting manner. The booklet is printed in two colors on white paper, 6 by 9 inches.

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Jean Grade, Long Trucks' Bane, Finally Overcome

Truck Conquers Famous Mountain Barrier

THINGS the motor truck will not do in the West are becoming almost more scarce than the vanishing elk lamented by writers in the sporting magazines and the ranchers around Jackson's Hole, who formerly derived a comfortable income from putting up and guiding titled Englishmen and others anxious to gather their own elk's teeth on the hoof.

There was a time—a mere matter of 3 or 4 years ago—when trucks could no more be driven from Los Angeles to San Bernardino than they could fly to the moon. Now the A. R. G. bus line shoots them over an asphalt boulevard from early morn to the passing of the Owl* after the theater, at 30 miles an hour. Mount Wilson, which to the eye of the tourist in Los Angeles or Pasadena, presents a sidewall apparently as vertical as the painted mountain on a theater drop curtain, has a stage route on which daily trips to the summit are made, occasioning as little astonishment as a ride in the jitney bus from Forty-eighth to Sixth on Main street.

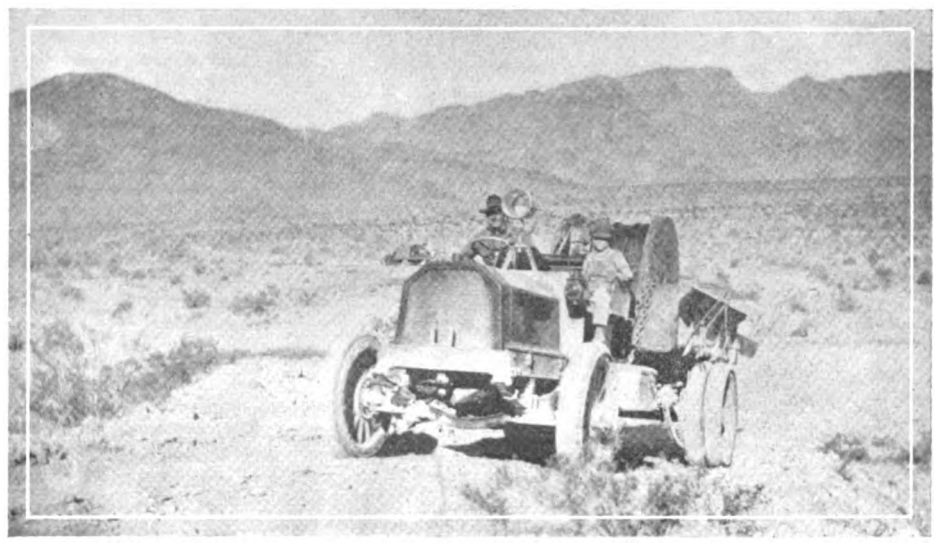
It is getting to a point where it is very hard to get a rise out of the westerner by telling him of wonderful new things the motor truck has done. Still, it does mean something to the initiated to learn that trucks are getting over *The* Grade at Jean, Nevada, without any help from the mules.

The Grade at Jean has been a pretty tough proposition. This whole country is tough on trucks. Quite a number of men who started to introduce truck haulage for the mines went broke there and lost their trucks. There was a time when there were a good many more trucks around Jean idle and abandoned than there were working.

The Grade had to take its share of the blame. The climb was long and steep and treacherous. The trouble with this desert gravel is that it lacks moisture. There is nothing for a binder. As long as it stays smooth on the surface, it is a very fair road. Once let the surface get broken and there seems to be no limit to the depth or surface area the soft spots will acquire. The Grade in the mine haul road at Jean was so bad that the county cut down the slope at the worst point. This left the surface softer than ever. Mule teams were constantly on hand to give a helping hand over the worst pitches. But now the grade is having capacity loads pulled over it without the aid of any mules.

By a process of natural selection a group of the very finest trucks have been gathered at Jean. They are operated by men who have learned not only how to operate trucks, but have mastered the tricks of the desert road. The mining man who drops into Gasoline Row at Los Angeles and remarks that he would like to get rid of the mules, but it is a bad climb into his mine and he is sure a truck could never make it is no longer able to fall back on the old defense against the salesman's aggressive attack. If the mining man declares: "I understood they put trucks in over to Jean and they done all right on the flat, but they couldn't make The Grade there," he gets the answer quick and truthful: "Stranger, your information is out of date. You mentioned just the worst mine road in the whole Southwest that trucks have ever tried to buck, and it is easy to prove that today trucks are doing the hauling at Jean and they are making The Grade, capacity loads every trip."

*The famous midnight train on the Southern Pacific from San Francisco to Los Angeles, one of the fastest trains in the West.



Peerless 6-tonner topping the grade at Jean, Nevada

CHANGE IN TRAFFIC SPIRIT

BOSTON, MASS., Jan. 2—The deluge of snow which covered the streets of Boston and suburban cities and towns the last two weeks made traveling for vehicles very hard, more particularly the horse-drawn vehicles. But it was noticed that the spirit of antagonism that had grown up between the drivers of teams and trucks has entirely disappeared now. In other years truck drivers would push their way along and grin at horse-drawn vehicle men when the latter were stalled. Not so this year.

Time after time when a heavily laden horse-drawn vehicle was held up along would come a truck, and its driver would stop, and slipping off the chain of the tailboard he would hook on to the less fortunate vehicle, jump back and at a signal start up. Away the two would go. Sometimes the motor vehicle pushed from the rear and sent the other vehicle along aiding the horses.

These occurrences were frequent, particularly during the holidays, and in the aggregate it must have saved hundreds of hours for the horsemen. The drivers of many trucks now formerly drove teams, which probably accounts for the change, as they appreciate what it means to be stalled on a cold day. In the old days the truck drivers were mechanics, and the horse-drawn drivers looked at them as interlopers, men who were going to steal away their jobs, so they were envious of them.

GOOD ROADS VS. INSANITY

TOLEDO, O., Jan. 16—S. M. Williams, who through diligent research has become an authority on good roads, has discovered in the course of his studies that good roads have a very potent effect upon the insanity rate. His discoveries show that the rate of insanity where bad roads prevail is higher than where there are good roads. He attributes this largely to the roads, inasmuch as the impossibility of conveniently getting about and mixing with one's kind, which is one of the effects of bad roads, induces a morbid condition. This is particularly true of farmers' wives who live in lonely districts. Mr. Williams is sales manager of the Garford Motor Truck Co., Lima, O.

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Accessories for the Truck

Rotary Valve Made of Carbon

Achieves Simplicity and Close Seal Cheaply

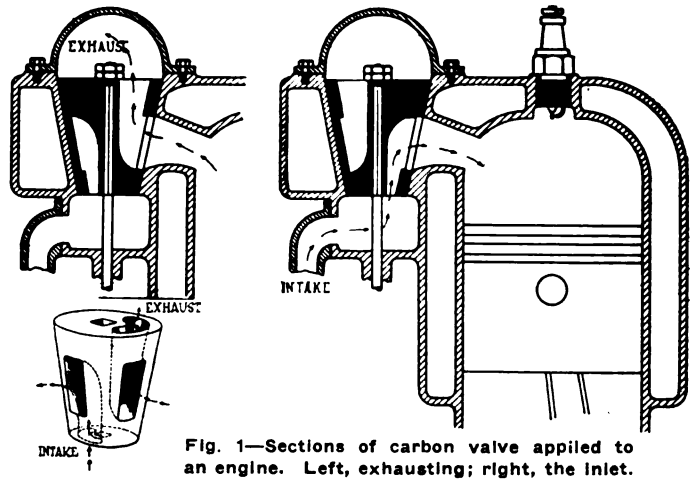


Fig. 1—Sections of carbon valve applied to an engine. Left, exhausting; right, the inlet. Insert, phantom view

DESIGNED to eliminate poppet valves from the conventional motor truck or passenger car gasoline motor, a new type of rotary valve patented and recently tested by Edward and Frank W. Heymann, Boston, Mass., is made of pure carbon. The valve is in the shape of a truncated cone and is revolved in a steel seat. As the coefficient of expansion of the carbon valve is slightly less than that of the steel seat any tendency of the valve to swell and stick in its seat due to the difference in temperature between the center of the valve and the exterior of the seat is practically eliminated. As the valve is made of commercially pure carbon, one of the best lubricants known, it is self-lubricating.

Carbon is also a material of great heat-resisting qualities, so that the heat of the hot exhaust gases does not burn out the valve or warp it. This property of carbon together with its anti-friction characteristic insure a tight fit between the valve and its seat, notwithstanding the high degrees of heat to which both parts are subjected. The inventors claim that their test engine has run for the equivalent of 40,000 miles of travel without the valves showing any signs of wear and without leaking.

Other claimed advantages of the valve are that it can be made at one-tenth the cost of the present-day iron poppet valve and that when worn out it can be replaced by another at much less than the cost of regrinding necessary on a poppet valve of the same life. It is also claimed that the tightness of the carbon valve in its seat throughout its period of usefulness will save a considerable amount of gasoline which is wasted with the conventional poppet valve as soon as it begins to become pitted and permits gasoline to leak past it when imperfectly closed. The use of such a valve would eliminate all grinding operations, and the necessity for spring adjustment as in the poppet type of to-day.

One carbon valve may serve to admit and discharge the gases from one or two cylinders or from three or more arranged concentrically about it. This is accomplished by the number of ports cut in the valve and the speed of its rotation.

A four-cylinder engine with its cylinders cast in pairs and equipped with two valves is shown in Fig. 2. One of the valves is partly removed to show its two ports.

As shown in the cross-sectional sketch, Fig. 1, the valve has two rectangular ports cut in its curved sides and placed approximately 90 deg. apart. A passageway is cut from one of these ports to the large top of the valve, terminating in a crescent-shaped opening. A second passage is cut from the other port to a similar crescent-shaped opening in the bottom of the valve. Each port and its communicating crescent-shaped opening are on the same side. The opening in the top serves as the exhaust port, and that in the bottom as the intake port.

The valve itself is placed in the space between the curvature of two adjacent cylinders and, in the case of the two-port valve described, revolves at one-half the motor speed. In case four instead of two ports are employed they are spaced opposite, but the valve is rotated at one-

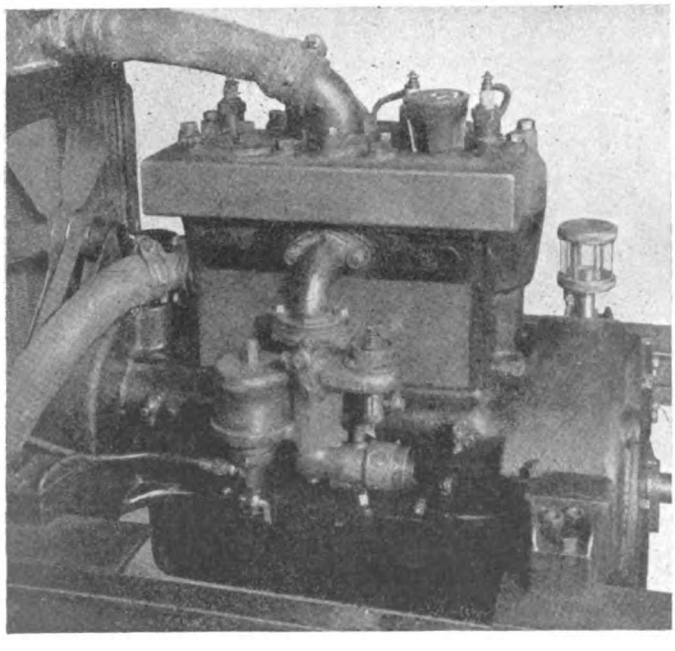


Fig. 2—Four-cylinder engine employing two Heymann carbon valves, with exhaust manifold removed and one of the valves raised from its seat

Fig. 3—Miller demountable cushion pad

Fig. 4—Truck wheel with pressed-on type of tire applied with the Miller cushion pad



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fourth the engine speed instead of one-half, as is the case in the two-port design. Each cylinder, therefore, uses opposite ports of the same nature alternately. Duration of opening depends on the port shape.

Another characteristic of the carbon valve is that only one passage is used from each cylinder to the valve seat and that this passage serves to both admit the incoming fuel and discharge the burnt exhaust gases. This is shown graphically in the sketch in Fig. 1, which gives the location of the exhaust manifold directly above the intake passage, with the valve seat situated between the two and the top of the valve in the exhaust manifold and the bottom in the intake passage.

At the beginning of and during the suction stroke the valve is rotated in its seat by conventional means or otherwise from the main crankshaft, so that the port in the valve is made to coincide with the port in the valve seat leading to one of the cylinders. The gas passes up through the bottom of the valve, through the coinciding ports in the valve and seat and into the passage leading to the cylinder. Then as the valve is rotated at half the speed of the motor, the latter has its compression and firing stroke before the valve has made one-half revolution and the exhaust port of the latter is brought opposite the valve seat port to permit the exhaust gases to pass through the valve and up into the exhaust manifold. A further one-half revolution of the valve similarly takes care of the intake and exhaust of the second cylinder of the unit.

The valve is carried on a vertical rod with a squared shank to keep it from turning in relation to the rod which is threaded at the extreme top for a hold-down nut which may be screwed down to take up any slight wear which might occur during the life of the valve.



Cushion Pad Holds Tire On

Rubber Compression Used as Retaining Means

COMBINING the features of both demountable and pressed-on solid-tire rims, with greater ease of attachment and removal than either, claimed greater security and the additional feature of added resilience, the Miller demountable cushion pad, just placed on the market by the Miller Rubber Co., Akron, Ohio, is in reality a tire-securing means combined with a wheel cushion.

Its principal purpose is to provide a means of securing a pressed-on type of tire to a standard S. A. E. felloe-band without the use of a hydraulic press, but an ordinary socket wrench instead. To effect this the compression of rubber is used.

The pad consists of a band of solid rubber inserted between the tire base and the felloe-band. It is of somewhat softer composition than that used in solid tires, ⅞ in. in section, and retained between two steel rings by twelve bolts. Nuts on the ends of these bolts serve to draw the rings closer together so that the rubber between is compressed and caused to swell both outward and inward, increasing its cross-section to more than an inch.

The pad is inserted between the steel base of the tire and the felloe-band of the wheel, these being of different sizes so as to provide an inch space all around. When inserted the bolts are naturally in the loosened state. They are then tightened and the swelling of the pad serves to lock the two together, the adhesion of the highly compressed rubber serving to give a non-creeping drive. In tests it is said that a 250-ton hydraulic press was found to be unable to force the tire from the wheel when the cushion pad was in place.

In addition to serving as a means of tire attachment the pad acts as a cushion which reduces the road vibration transmitted to the wheel, axle and mechanism, and lightens the duty of the tires.

The Miller company advises the use of tires one size—2 in.—greater in diameter than the original equipment, so that the same wheels formerly used for pressed-on tires may be retained. An alternative to this is to fit wheels the next size smaller, since this would not affect the effective power reduction. An increase of 2 in. in the size of tires normally 36 in. is equivalent to a 5-per-cent decrease in gear reduction, approximating 300 ft. additional travel in every mile.

The Miller cushion pad actually permits easier removal than with the wedge-type demountable tire, since the metal surfaces do not touch and cannot therefore rust together. The tire is removed or replaced with the wheels on the truck, and can be done in a few minutes, unlike the pressed-on type.

It is claimed that the use of the pad, through reduction of vibration, permits greater speed without harmful effect; that it permits the tires to be worn down to the steel channel; that it prolongs tire mileage, and that one set of pads will outlast several sets of tires.

Although just placed generally on the market it has been in use in the West for several months.

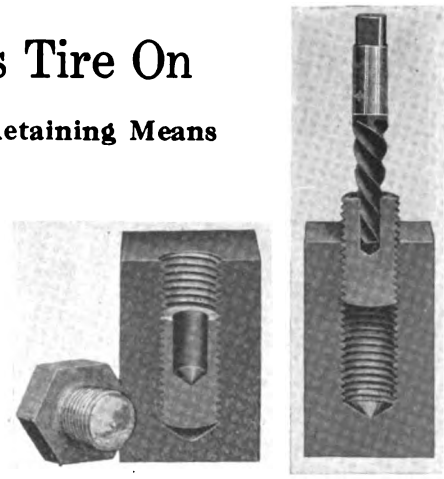


Fig. 5—Ezy-out screw extractor in use. Left, the broken screw drilled out. Right, the Ezy-out turning it out

Removes Broken Studs—Threads Unharmed

EXTRACTING broken set-screws, studs, etc., has always been a difficult job. Thanks to a new device just brought out by the Cleveland Twist Drill Co., Cleveland, it need no longer prove a tedious process. A brand new device known as the Ezy-out screw extractor set is illustrated in Fig. 5. This consists of a form of tool similar to a drill except that it has no point and has a taper from the shank down.

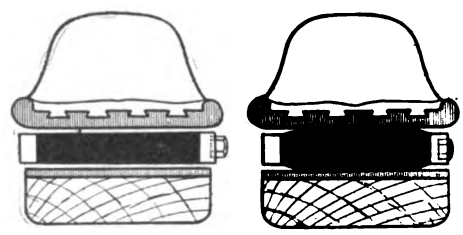


Fig. 6—Action of the Miller cushion pad. Left, how tire is applied or removed, bolts all loosened and all parts free. Right, with bolts tightened and rubber compressed to form a bond between tire and felloe-band

As shown in the figure, a hole is drilled in the broken section with some size of drill smaller than the hole and the extractor is inserted. Twisting on it with a wrench serves to cause it to grip the sides of the hole, because its twist is left-handed in opposition to that of the screw thread. When it has gripped the screw is forced to turn with it. The set, comprising three extractors of standard sizes in a wooden box retails at $1.75 complete.

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Men and Makers

WILLYS-OVERLAND CO. will shortly add 200 employees to its plant in Elyria, Ohio.

Reo Motor Car Co. employees have formed a mutual motor club to carry them on their way to and from the factory. Certain workers act as chauffeurs and the expenses are borne co-operatively by the members.

Mountain Motors Co., Denver, Col., has secured the Packard distributing agency for all of Colorado excepting six counties in the Colorado Springs and Pueblo districts and for a part of Wyoming.

Day Baker Motor Truck Co., a new company, organized by Day Baker has been made New England distributor for the Hurlburt Motor Truck Co., New York City. The Day Baker company will locate in Boston and will carry a complete line of models and parts and will render service in that territory. Mr. Baker is one of the best known members of the New England trade and was formerly for a considerable period manager of the Boston branch of the General Vehicle Co. He has been very active in electric-vehicle sales for many years, and this is his debut into the gasoline field.

L. A. D. Motors Corp., Brooklyn, N. Y., will handle the Peerless line for Kings and Queens counties.

Packard Motor Car Co., Detroit, has purchased property in Newark, N. J., worth $180,000 as a site for the Northern New Jersey headquarters.

Stegeman Truck Co. of New England, Boston, Mass., has been organized to distribute Stegeman trucks.

The New England Velie Co., Boston, Mass., has opened new quarters at the corner of Brookline Avenue and Jersey Street.

Packard Motor Car Co., Chicago, Ill., has taken a new garage at 4357 South Wabash Avenue.

Garford Motor Truck Co., Lima, Ohio, will establish a branch factory at Kansas City, Mo.

Charles Motor Co., Boston, Mass., Briscoe distributor, has moved into a new plant at 167 Massachusetts Avenue.

Superior Motor Car Co., St. Louis, has succeeded the Sterns-Knight Auto Co. as distributor of the Inter-State Motor Car Co. It is the same organization with the change of name.

Anchor Auto Co., St. Louis, Mo., has arranged to handle Commerce trucks, with J. B. Felko as manager.

Kardell Motor Car Co. of St. Louis has contracted to handle the Kelly-Springfield trucks in addition to its Reo line.

International Motor Truck Co. has opened salesrooms for western Missouri and eastern Kansas at St. Louis, Mo., representing the International Harvester Co.

Velie Motor Co., Leavenworth, Kan., has moved into larger quarters.

Burt Noble Motor Car Co., McKeesdrop, Va., will distribute Kohler 1-ton trucks.

Yeager Inter-State Motor Co. has opened for business at Wichita, Kan.

Ingram Motor Co. has rented quarters at Peoria, Ill., and will distribute the Jeffery in sixteen counties. Harry B. Rush will be sales manager and C. F. Graber in charge of the service department. The company has been located at Rutland, Ill.

Gruilock Auto Station, North Adams, Mass., has taken the Maxwell agency for this territory.

Osthoholff & Daukman, Cincinnati, Ohio, will distribute Koehler 1-ton trucks in that territory.

Willys-Overland, Ltd., West Toronto, Canada, has established a branch at Winnipeg to serve Manitoba dealers.

L. C. Auto Co., Jackson, Mich., has been appointed agent for Peerless and Federal trucks.

D. W. Young Motor Car Co., Birmingham, Ala., is now state distributor for the Packard.

High-Seventh Garage has been made distributor for the Denby truck for central Ohio.

Selden Garage Co., Birmingham, Ala., of which Charles Venegere is proprietor, has taken the agency for Service trucks.

Star Rubber Co., Akron, Ohio, has started production in its new factory.

Pollack Tire & Rubber Co. will turn over its Philadelphia branch to Maxwell Smullen, its present manager.

Hood Tire Co., Watertown, Mass., has opened a branch in Atlanta, Ga., with I. W. Hill as district sales manager for the Southeastern territory.

Fisk Rubber Co., Chicopee Falls, Mass., is moving into its new factory, which is 600 ft. long, 105 ft. wide and has six floors.

Goodyear Tire & Rubber Co., Akron, Ohio, has formed a club for its alien employees, where they may learn American ideals and be educated for citizenship in the United States.

Pennsylvania Rubber & Supply Co. has bought the Erie Supply Co., Toledo, Ohio, and has appointed H. B. Sims as manager for the Toledo branch.

Auto Supply House, Baton Rouge, La., will open here shortly under the management of John F. Hocks to handle Fisk and U. S. tires.

Mason Tire Co., Kent, Ohio, will establish a Kansas City branch at 1732 Grand Avenue.

Fisk Rubber Co., Chicopee Falls, Mass., has bought land for a proposed branch house in Madison, Wis.

Prest-O-Lite Co., Indianapolis, Ind., is establishing a number of new battery-service stations in all sections of the United States.

Brown Motor Co., Moline, Ill., will manufacture an annular-valve gasoline motor for commercial vehicles and passenger cars.

Standard Aluminum Co., Two Rivers, Wis., has completed a new smelter mill.

Elyria Iron & Steel Co. has completed a large addition to its Cleveland tube mill.

Progressive Metal & Refining Co., Milwaukee, Wis., has started work on its new factory, which will have about 55,000 sq. ft. of floor space.

Gilson Mfg. Co. of Port Washington, Wis., is expecting to manufacture multi-cylinder engines for use in tractors, trucks and passenger cars, according to



Over the Dixie Highway from Chicago to Tampa, Fla., the Diamond-T 2-ton truck shown above is forging ahead at the rate of 70 miles a day in the charge of two Wisconsin woodsmen and hunters. The trip is being made as a demonstration of the stamina of the Chicago-made vehicle and to deliver a cargo of spare parts to Hixon & Warder, south Florida distributors of Diamond-T trucks. Bill Paull and Tom Phillips are the crew, hailing from the woods near Woodruff, Wis., and experienced wielders of axe and spade. So far they have encountered almost uniformly poor roads, but anticipate no difficulty before reaching the mountains of Tennessee

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reliable report. William Baumheckel, tractor engineer, joined the company Jan. 1.

Cook Railway Signal Co., Denver, Col., has reorganized to operate in Chicago under the name of the International Electric & Signal Co.

Tennessee Auto Sales Co., 251 Monroe Avenue, Memphis, Tenn., has taken the agency for Troy trailers in the State of Tennessee and northern Mississippi.

Standard Automobile Works, Tacoma, Wash., has become agent for the Amestón truck adapter for Fords.

Chadick, DeLamater Corp., New York City, agent for Continental engines, has moved into its new quarters at 159-161 West Twenty-fourth Street.

Kellogg Mfg. Co., Rochester, N. Y., manufacturer of engine-driven tire pumps, has opened a Toledo branch with E. Kirk as manager.

H. W. Johns-Manville Co. has opened its fifty-fifth branch office in Des Moines, Iowa, with W. B. Roberts as manager.

Portland Body Works, Portland, Ind., will build a new factory costing $15,000.

Lasure Friction Truck Pulley Co. has moved from Charles City, Iowa, to Madison, Wis.

Blackwell Welding Co., Dayton, Ohio, has secured a new building in Toledo to be used for machine and store rooms.

C. B. Voorhis has resigned as vice-president, director and general sales manager of the Oakland Motor Co. to become head of the selling division of the Nash Motors Co., Kenosha, Wis. Mr. Voorhis in coming to the Nash organization once more joins forces with C. W. Nash, who at the time he was president of General Motors Co., was also president of the Oakland Motor Co.

George J. Sheppard has been elected vice-president of the Canadian Pneumatic Tool Co., Canadian representative of the Chicago Pneumatic Tool Co., builder of Little Giant trucks. Mr. Sheppard is president of the Montreal Automobile Trade Association. He has managed the Canadian concern for some time and this action was taken in appreciation of his efforts at a meeting of the board of directors recently held in New York.

P. G. Little, who during the period when the French army was buying trucks in large quantities in this country was official French army inspector at the Jeffery plant, has been made chief inspector of the plant by the Nash Motors Co., successor to the Thomas B. Jeffery Co., Kenosha, Wis. When the last French order had been filled Mr. Little's duties came to an end and so he was released from such duty and immediately accepted the position above. Mr. Little was formerly in the engineering department of the Crossley Motors, Ltd., in England. Later he crossed to America and entered the engineering department of the Marathon Motor Car Co., Nashville, Tenn. He became chief designer for the Haynes company at Kokomo, Ind., from where he went to Kenosha.

H. H. Harwood will handle the sales of G. M. C. trucks, Bull tractors and Warner trailers for Northwest Buick Co., Seattle, Wash.

J. F. Newlan and Clarence Madeock, Chrisman, Ill., will handle the Studebaker agency in that territory.

G. P. Miller will distribute Jeffery trucks and cars for the central sections of the Mississippi Valley as general agent of the Nash Motors Co., Kenosha, Wis. He was formerly with the Hokasam Automobile Co., Madison, Wis.



The largest tire in the world, a Firestone Giant 42 by 14 solid, designed for heavy trucks, such as 6- and 8-tonners. It is of greater capacity than 7-inch duals and being single, it has manifold advantages. Note the three grooves in the tread which impart resiliency, relieve strains and otherwise make this brobdingnagian tire a practicability

M. F. Todd, El Centro, Cal., will distribute Jeffery trucks and cars in that territory.

Robert F. Black has been appointed manager of the International Motor Co.'s Philadelphia branch which distributes Mack and Saurer trucks.

C. W. Cornell has been appointed manager of the White Co., Portland, Me., branch.

Lewis Trexler, Dubuque, Iowa, has erected a new display and sales office for Packard cars.

Martin Garman has entered the motor truck business at Kansas City, Mo., to distribute the Dearborn truck adapter for Fords. He was formerly with the public service commission at Jefferson City.

Daniel Zeifloft has joined the sales force of the Star Rubber Co., Akron, Ohio. He was formerly with the Marathon Tire & Rubber Co.

O. L. Weaver will have charge of the exhibition of the Star Rubber Co., Akron, Ohio, in the Auditorium Hotel, Chicago, during the show in that city.

Henry Olmsted will handle the Nebraska and Kansas territory for the La Crosse Rubber Co., La Crosse, Wis.

R. S. Hartzell has been appointed state representative for Ohio of the Goodyear Tire & Rubber Co., Akron, Ohio. F. N. Hammond succeeds Mr. Hartzell as manager of the Cleveland branch coming from the managership of the Youngstown branch.

A. C. Searle has been made manager of the Firestone branch in Minneapolis.

A. R. Griffin has taken a position of production and general factory manager of the Kellogg Mfg. Co., Rochester, N. Y. He was formerly with the Timken company, Detroit.

Decatur Electric Battery Co., Decatur, Ala., has opened a Willard battery service station.

Day School for Deaf-mutes has been established by the Goodyear Tire & Rubber Co., Akron, Ohio, as a department of its factory schools. Ashland D. Martin, himself afflicted in this way, and a graduate of Gallaudet College, is director of the new division. There are about 200 of these silent workers in the Goodyear plant. The chief subjects taught are business arithmetic, English and mechanical drawing.

Springs for Various Vehicles are listed in a very convenient and informing booklet issued by The Triple Action Spring Co., 549 West Fifty-ninth Street, New York City. Besides a table giving the names of different cars and trucks, their models, horsepower, year, size of front and rear springs, stock number of spring and price, the booklet contains descriptions of different types of springs and instructions for measuring springs, a list of standard spring-clips in stock and information as to how to order them.

Federal Training Course, instituted in the plant of the Federal Motor Truck Co., puts through the mechanical department from 25 to 100 men selected from the employees for exhibited aptitude each year. That the course is a success is indicated by the fact that a number of graduates are now among the largest distributers of Federal trucks. Others are dealers in various cities, and some have become identified with other large manufacturing companies. The idea is to intensify training so that by special facilities a man secures in one year a training which would require four years as an apprentice.

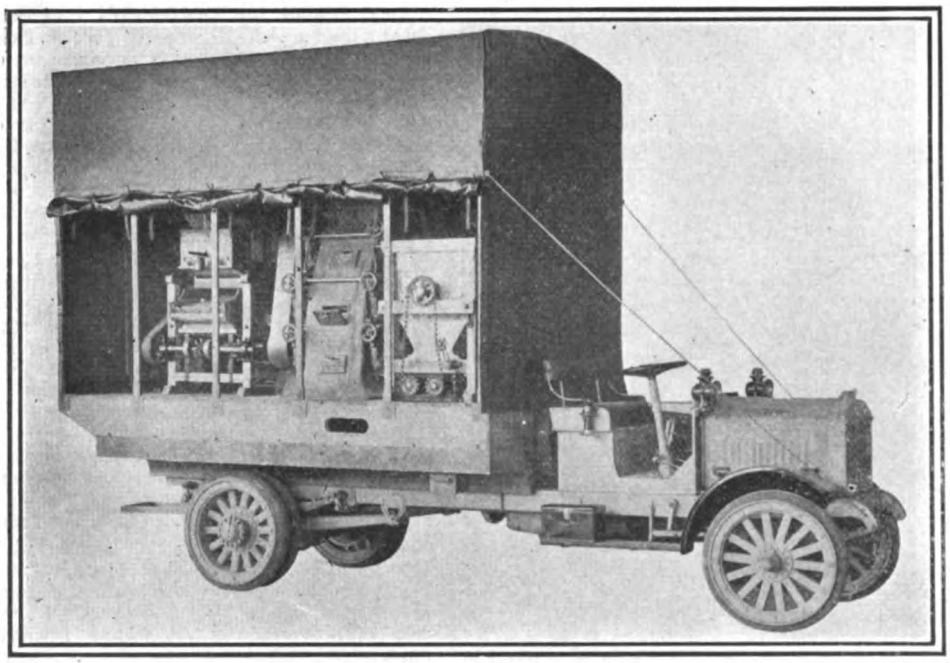
Motor Imports are Forbidden India by an order of the government of India which went into effect Dec. 23, 1916. This applies to commercial vehicles and passenger vehicles, chassis of both, motor cycles and all parts and accessories except tires, whether of British manufacture or foreign. Of course, this does not include vehicles or parts imported by the government or under government license. Special licenses will also be granted for the importation of parts for repairs.

Customs Duties in Spain on motor trucks often cause serious confusion and hardships on exporters, owing to a provision in the customs law which causes customs officers to rule any vehicle not containing a closed or closeable merchandise body as a passenger car. There are two duties: the first is $3.50 per 100 pounds net weight for motor trucks, the other $19.30 per 100 kilos for chassis. It is accordingly much cheaper to apply a commercial body with some form of top than to ship trucks stripped or with only platform bodies.

Australian Homing Tires represent a new contribution to motoring accessories. The rough nature of the country, the dearth of good roads, and the excessive heat militate greatly against rubber tires. As a substitute for them, the Homing tire made of Coir fiber has been made. This material is very light and cheap, and contains a surprising amount of resilience and durability. It is fabricated in the form of a huge rope whose ends are spliced to form a continuous band, secured to the wheel by four or five straps.

It was first produced as an emergency tire to be applied in case of tire trouble. It is now in general use in rural districts as a complete substitute for pneumatic and solid tires. The Homing tires are bullet, nail and glass-proof, and are almost as easy riding as pneumatics at speeds below 16 miles per hour.

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Russia is a land of wheat, but before wheat can be made into bread it must be ground, and with an army on the march this is not always easy. The above-illustrated outfit has accordingly been devised by the Russian army to follow the troops and grind the native wheat for bread. It is mounted on a 3½-ton Bessemer chassis and is equipped with a flour mill operated from the power of the motor. It is said to be capable of grinding 200 bushels of wheat in 10 hours. Unless the machine is top-heavy, it would seem that the experiment should prove a valuable one

First Motor Truck in Ceiba, Honduras, arrived from New Orleans Jan. 3, and is to be used by an ice manufacturer. There is opportunity for more vehicles in this vicinity among the planters if their ill-founded prejudice can be overcome, which seems likely now that the ice company has one.

Oil Trucks in Curacao, West Indies, are the only vehicles used on the island. They are the property of the Bataafsche Petroleum Maapschappij, which is erecting a large petroleum refinery at Willemstadt. The island has a population of 33,000, 11,000 of whom live in Willemstadt. This refinery is supplied with oil by steamers from Venezuela. The climate of the island is very dry, but the roads are excellent, and even the streets of the town are such as to permit motor trucking. However, the fact that there is such good water transportation, cheap labor, that hauls are so short, that there are no other manufacturing industries other than the refineries, and that there is but one town, somewhat restricts the market.

Demands for Farm Tractors in Cuba are increasing, and it is believed that there are opportunities for the sale of many vehicles of this type during the coming year. Some of the larger sugar estates already have tractors in operation. As a rule these are of the heavier type and are used for ploughing and preparing the land for the planting of cane and other crops. The Cuban market calls for machines of the best type. Gasoline has been used principally as a fuel, although prior to the advance in price of alcohol the latter was used to some extent. Prices of mules and oxen are at present very high in Cuba and due to the prospect of a continued advance in the cost of these animals, it is likely that there will be a larger demand for farm tractors of the lighter type for use on the smaller farms. Tractor manufacturers who desire to enter the Cuban market can obtain much valuable information from the agricultural experimental station at Santiago de las Vegas. Mr. H. A. Van Hermann, an American employed by the Department of Agriculture of Cuba as expert demonstrator, is in a position to give considerable valuable advice. He may be addressed care of the department in Habana. Tractors for use in agricultural operation are classified under No. 216 of the Cuban import tariff. With the 20 per cent reduction allowed to products of the United States under the reciprocity agreement they are dutiable at the rate of 8 per cent ad valorem. A certificate signed by the alcalde of the municipality where the tractor is to be used must be obtained showing that the machine is employed exclusively in the preparation of the ground or in gathering crops.

Packard Motor Car Co., Detroit, will have 4 acres of additional floor space when six extensions now under way are completed. These additions comprise two six-story wings on the stock building, 103 x 200 ft. each; an extension of the main power house, 65 x 140 ft., which will double the space in that department; a traffic garage, two fourth-story additions to the technical service group, some lumber sheds and a finished-truck storage building. The total floor area of the plant upon the completion of these additions will be 58.6 acres. There are now sixty-six buildings in the plant.

Continental Motor Truck Co., Superior, Wis., has awarded final contracts for the erection of the power house of its new motor truck factory, and expects to be able to begin operation in the new plant by Feb. 1. About $60,000 is being expended for buildings and equipment. The company has been building trucks on a limited scale for eighteen months in leased quarters. Dr. J. G. Barnsdale is chief owner and the designer.

Packard Motor Car Co., Detroit, has acquired approximately one acre of land centrally located fronting on Jefferson Avenue, St. Antoine and East Woodbridge Streets, here, on which it will erect an eight or ten-story building to be devoted entirely to its Detroit sales and service branch now located at factory. The scope of the service department will be extended by making provision for taking care of the cars of Packard owners by supplying facilities for their storage during the day. The company will come into complete possession of land June 1, 1917.

McFarland-Westmont Tractor Co., Lodi, Wis., has selected Sauk City, Wis., for the permanent location of its factory, and is now engaged in installing equipment, and will be ready to begin production by Jan. 1. The company has leased a $20,000 factory building erected by citizens of Sauk City for the purposes of the Shaw Motor Co., Chicago, which intended to locate in Sauk City a gasoline engine plant. The deal fell through after the building was completed and most of the equipment installed. It requires unimportant changes to make the factory suitable for the manufacture of steel tractors.

Motor Pep Mfg. Co., Youngstown, Ohio, recently incorporated with $50,000 capital to produce a gasoline intensifier and decarbonizer, has organized by electing the following directors and officers: C. G. Morley, president; J. A. Miller, secretary and treasurer; W. E. Elliott, general manager, and Charles Please, M. Smith and E. J. Holway. The company is seeking a site for its plant. Members of the company are largely connected with the engineering department of the Youngstown Sheet & Tube Co.

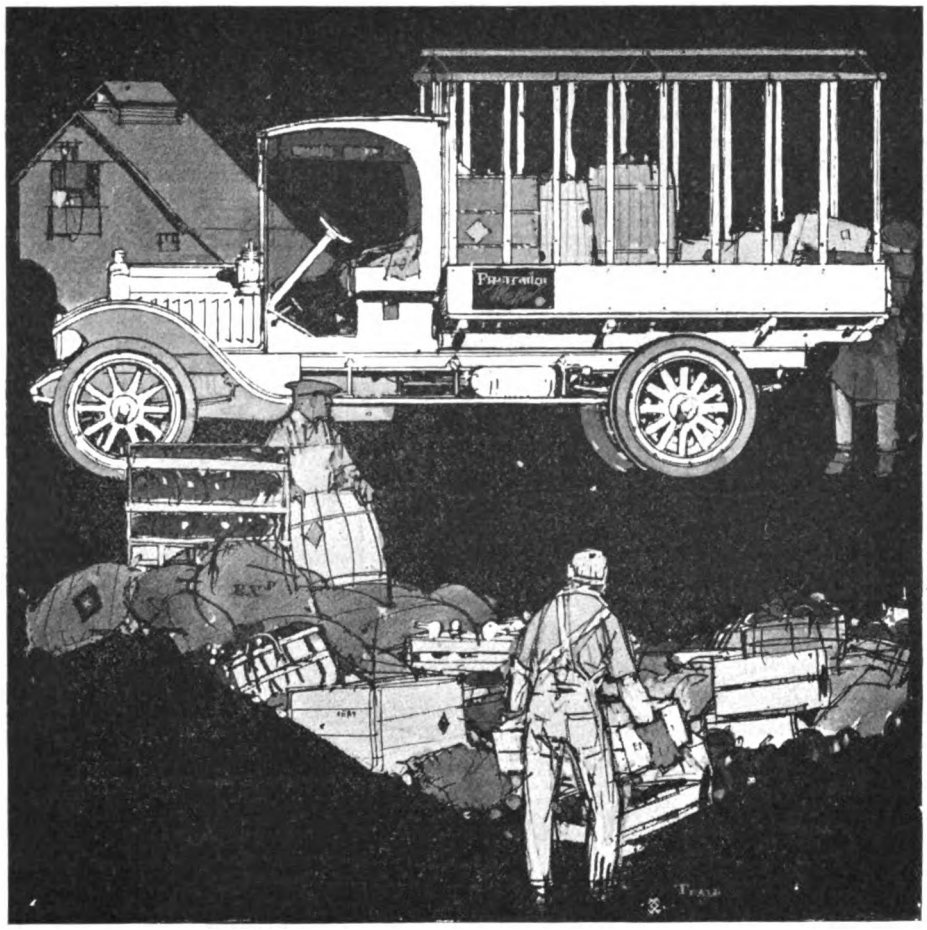
National Motor Supply Co., Cleveland, which has been manufacturing a line of automobile accessories in this city for the past eight years, has been taken over by a Painesville, Ohio, corporation. Contract for the erection of a large factory in Painesville has been let. It is understood that the stockholders received in the neighborhood of $200 per share, the par value being $100.

Flint Automobile Technology Club has been formed in Flint by twenty-five technical men employed in the various Flint automobile factories. The club is expected to be the center of a new field of engineering activity in Flint, and its object will be to promote the art, sciences, crafts and methods pertaining to the manufacture of automobiles and to bring the automobile engineers of Flint closer together.

Kenyon Riddle of the engineering firm of Riddle & Riddle, Abilene, Kan., has been made secretary of the Kansas Automobile Trade Assn., Topeka. Temporary headquarters have been opened in Topeka, and he is now engaged in outlining a legislative program and in preparing for a state meeting Jan. 15 in Topeka. Riddle has been City Engineer of Abilene. Salina is planning a show to be held before or after the Kansas City Show in February.

The Hood Service Bureau, Detroit, maintained by the Wallace C. Hood company, has extended the courtesy of its services to motor vehicle editors who may have business in Detroit at any time. One of the company representatives will arrange for hotel accommodations if desired. It also extends the freedom of its offices, including stenographic services, telephones, etc., and will also deliver letters or telegrams addressed to any such editors at the Hood bureau.

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AN INVISIBLE EXPENSE OF TRUCK OPERATION WHICH CAN BE AVOIDED

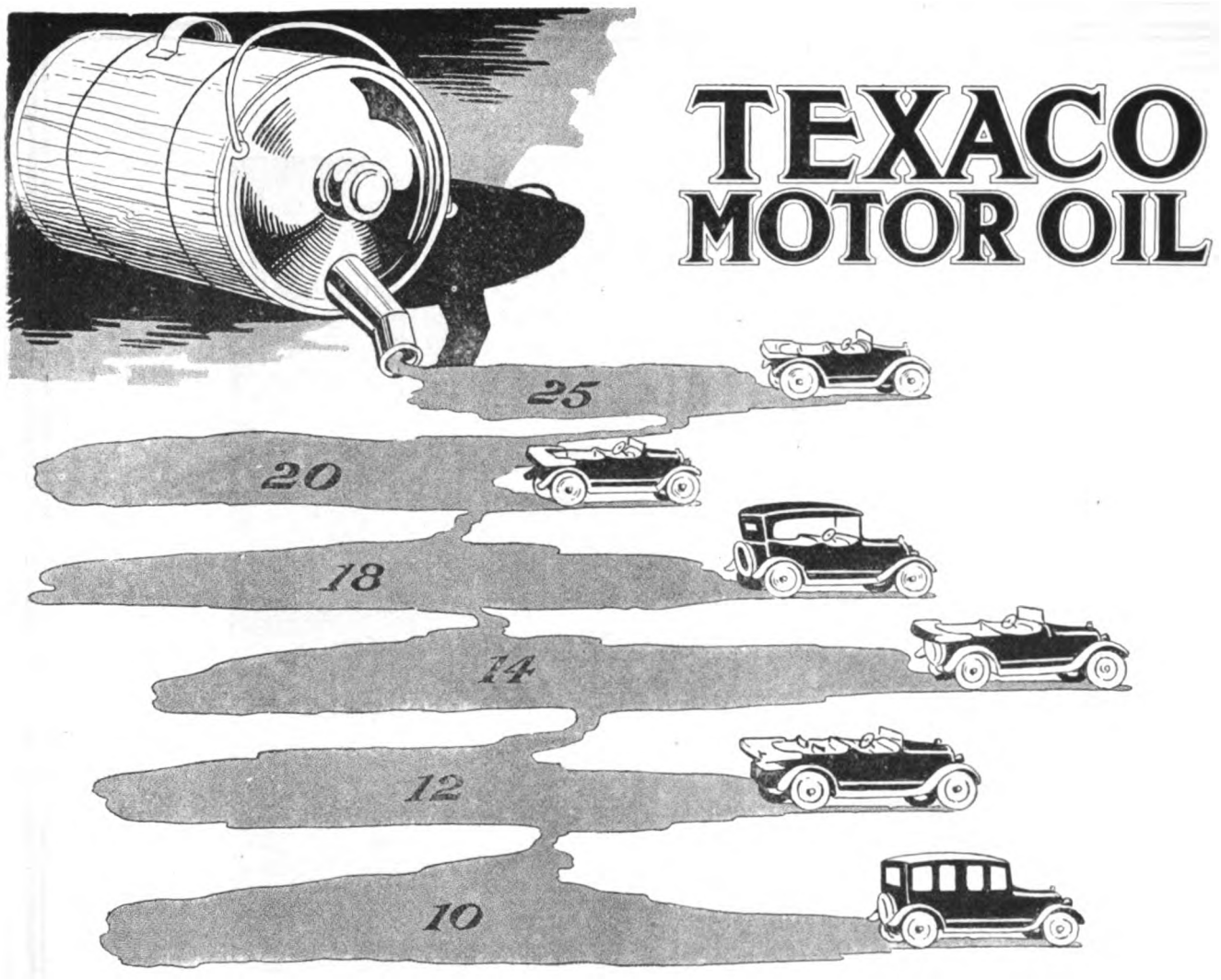
AN invisible item of expense, often overlooked by motor truck users, is the time lost for repairs. The unavoidable items of fuel, oil, tires and upkeep appear on your books, but they may not be nearly so serious a leak in your profits.

It is estimated that three days of lay-up and idleness will cost the owner more than a month's operating expense (driver's wages excluded).

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Texaco Motor Oil is a southern oil with an asphaltic base. It is admitted by the most eminent authorities that the hydrocarbons composing the asphaltic base oils *cannot* form hard carbon. You who have had hard carbon cut and score piston rings, cylinder walls, and valves, know what this means.

Texaco Motor Oil stands up well in use because it gives a good seal to the piston and rings and prevents leakage of gasoline into the crank case.

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When you buy motor oil buy Texaco. The best way, the safest way, is in 1 or 5 gallon cans.



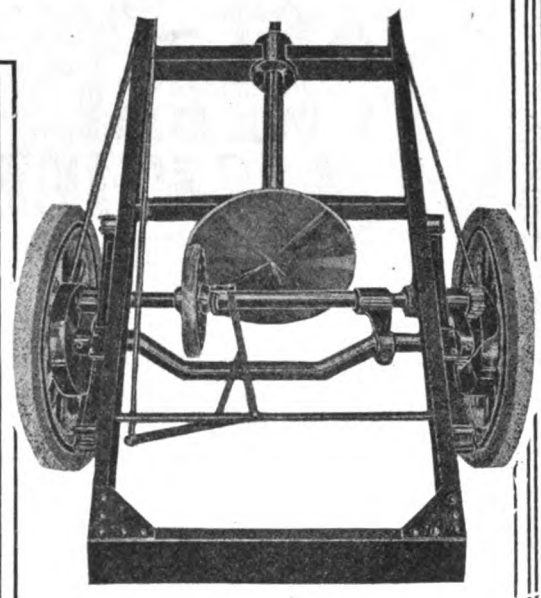
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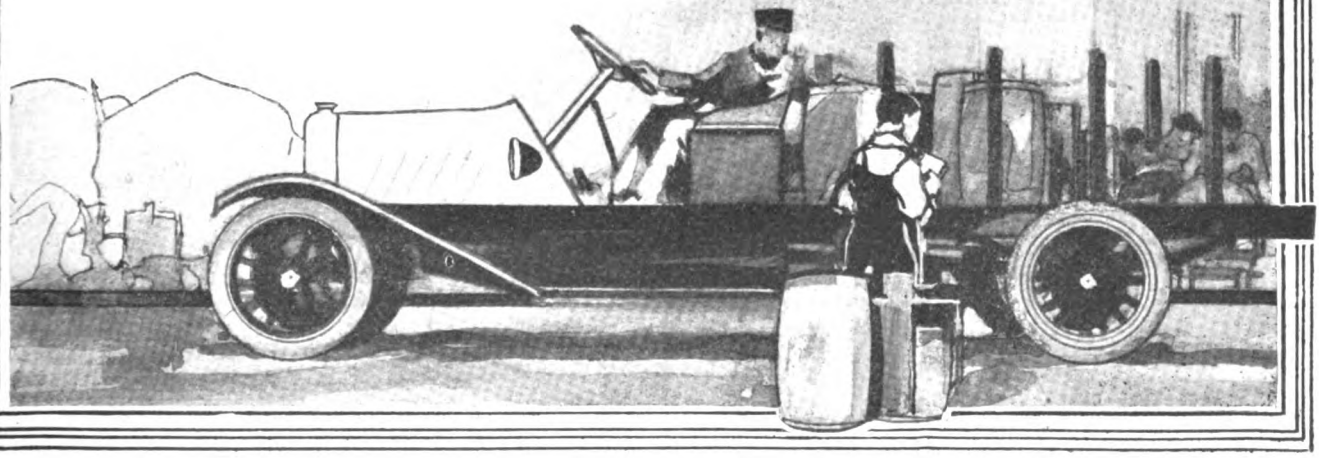
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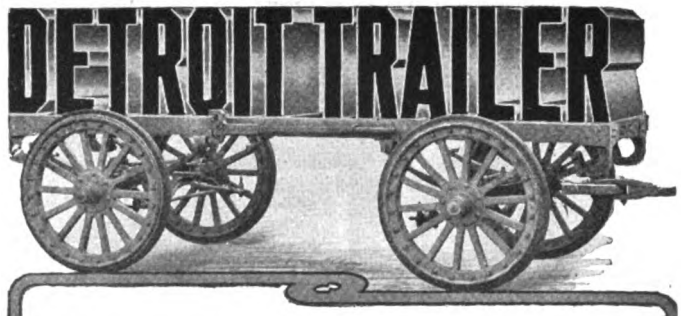
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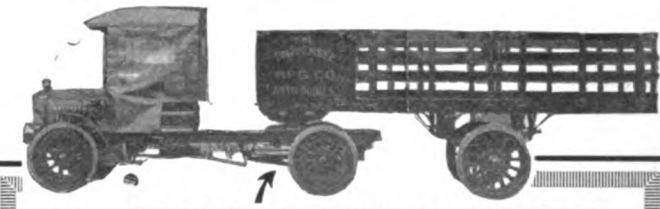
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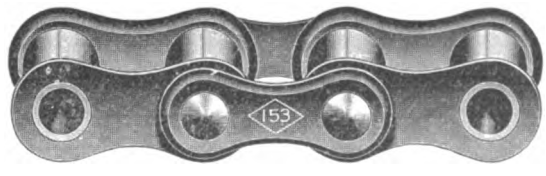
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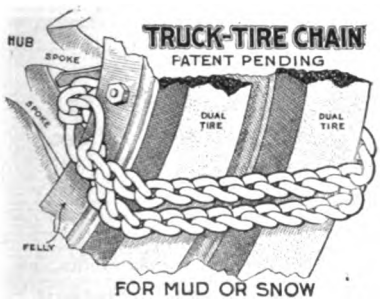


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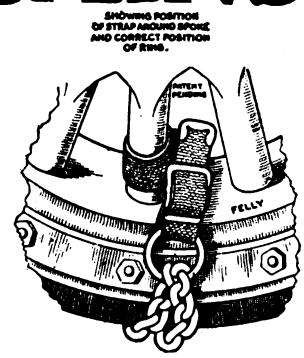
TRUCK TIRE CHAINS



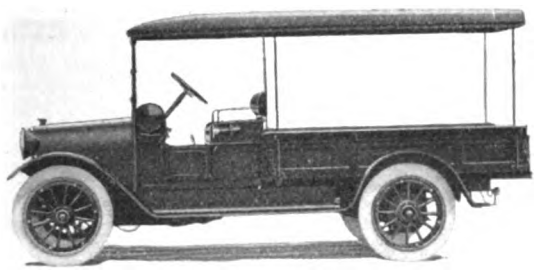
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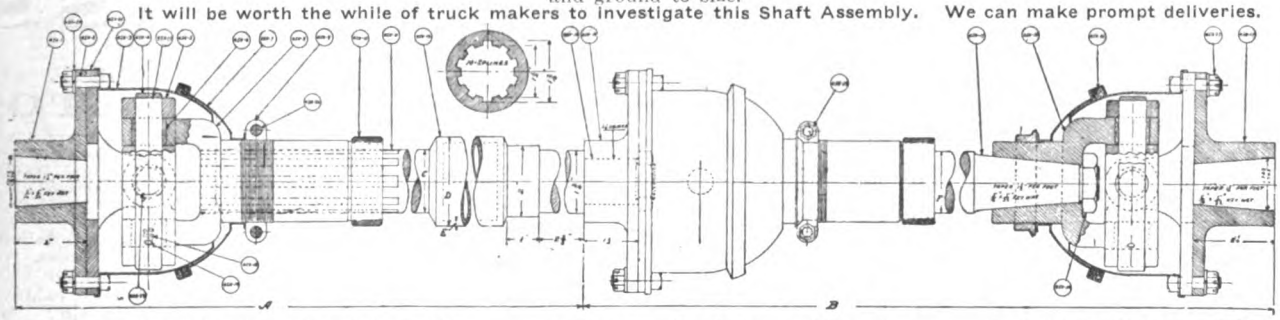
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2 " 5 "
7 ton

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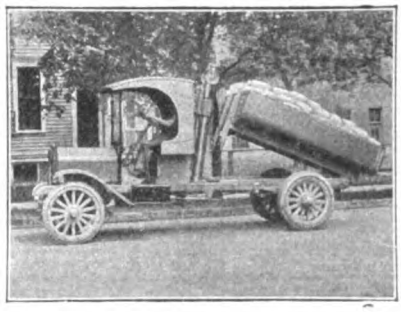
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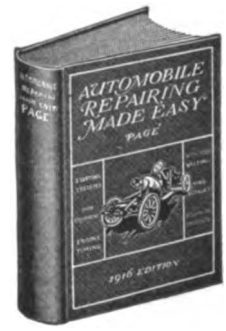
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BUILT IN NEW YORK

The Thomas is keyed to do things a little better than the best—it has a mission beyond the ordinary. What you know about other trucks is no guide as to what your customers can expect from the Thomas.

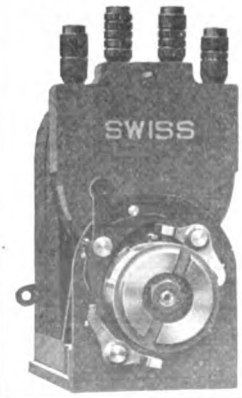
The Two Ton Worm Drive

YEARS AHEAD

Dealers—write for specifications and open territory

THOMAS AUTO TRUCK CO., Inc.
Factory and General Offices
639 W. 51st Street, New York City

IN EUROPE THE SWISS



Is Considered
America's Finest
MAGNETO

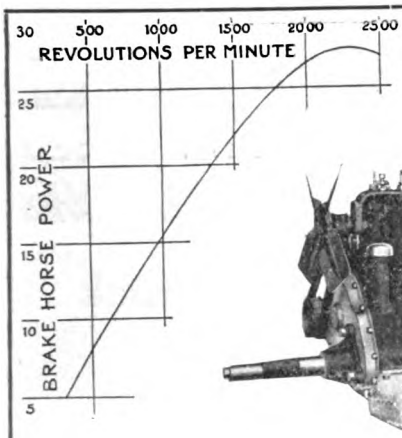
In America, as fast as we can assure them deliveries, the foremost manufacturers of cars, trucks and tractors are adopting the Swiss Magneto in place of cheaper ignition—regardless of the price of their own product.

The Swiss Safety Starting Coupling absolutely prevents back-kicks from pre-ignition. Exclusive on the Swiss.

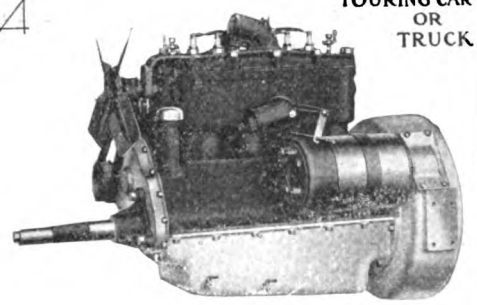
Get in line. Write or wire today for particulars. Ask for Bulletin 2.

SWISS MAGNETO COMPANY
MONROE, MICH.

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LE ROI MOTOR
3⅛×4½ MODEL C
FOR THE LIGHT ROADSTER
TOURING CAR
OR
TRUCK



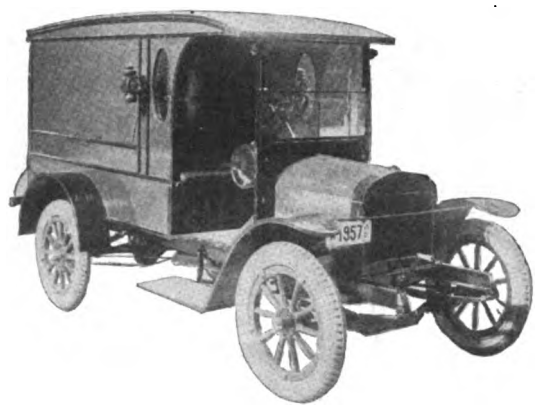
Used by leading manufacturers of best-known American-made light trucks.
The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

CABLE LE ROI MILWAUKEE



$675 Open Express Body

The **CORLISS** ½ Ton

$695 Full Panel Body

Light Delivery Truck

Extreme light weight, consistent with carrying 1000-lb. load, makes CORLISS Half-ton Light Delivery Trucks most economical in service.
Carefully selected parts—of known merit and efficiency—make CORLISS Light Trucks a new standard at their price.
Borg & Beck Clutch, Le Roi Motor, Covert Transmission are but the beginning of a list of accepted standards that make up the CORLISS Truck.
Write for catalog and full standard specifications.

CORLISS MOTOR TRUCK COMPANY
Corliss, Wisconsin

Garford MOTOR TRUCKS

Garford Trucks range from one ton to six tons in capacity.

They are designed and built by men who have spent their lives in the study of motor trucks.

They are backed by one of the strongest organizations in the industry.

Bodies are provided to meet all requirements.

Write for catalog. Please address Dept. 103

The Garford Motor Truck Co., Lima, O.

BROWN-LIPE

transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

BROWN-LIPE GEAR CO.
SYRACUSE, N. Y., U. S. A.

BROWN-LIPE CHAPIN CO.
Differentials Transmissions

NEW YORK—Thos. J. Wetzel, 29 West 42d St.
SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C.

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WICHITA TRUCKS

Dependability Plus Service

We want a Dealer with energy and spirit,—we want one who will make the co-operation with him of our factory organization worth our while, and his. We want men who can interest concerns in our heavy-duty trucks and then not let up until they sell them.

If you are such a Dealer we have an interesting selling proposition that will interest you immensely.

Besides the WICHITA 3½-ton capacity truck, we have a 2½-ton and a 5-ton truck—both worm driven.

Write us for our plans.

WICHITA FALLS MOTOR COMPANY

Arthur Boulevard, Wichita Falls, Texas

Thermoid

HYDRAULIC COMPRESSED Brake Lining—100%

An Overturned Truck

reflects discredit on both owner and maker. However the accident may have happened, many people say: "Careless driver," or "Irresponsible owner," or "Unreliable maker."

Thermoid Brake Lining won't prevent all kinds of accidents, but it most positively will prevent all those that come from slipping brakes—brakes that fail through their lining. Here is a big source of costly accidents eliminated at trifling expense.

Thermoid will grip with friction power even when worn thin as paper. It is one single solid mass, made so by hydraulic compression. By weight it shows 50% more material than any other brake lining. That material is long-fibre Canadian asbestos spun on brass wire and impregnated with a friction compound which is also impervious to heat, water, oil, gasoline or dirt.



Cannot be burned out nor affected by oil, heat, water gasoline, dirt.

Your Guarantee

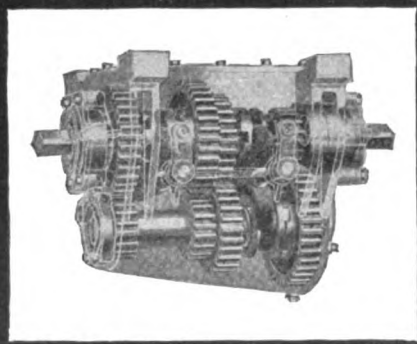
Thermoid Brake Lining is absolutely guaranteed to give more satisfactory results and to outwear any other lining manufactured. Not affected by heat, oil, water, gasoline or dirt.

Thermoid Rubber Company

Trenton, New Jersey

Makers of a full line of automobile accessories and mechanical rubber goods.

COTTA TRANSMISSIONS

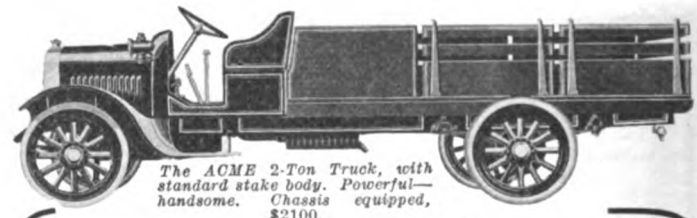


All Gears Always in Mesh

An Assurance of Dependable Service

The Cotta Transmission Co.

Rockford, Ill.



The ACME 2-Ton Truck, with standard stake body. Powerful—handsome. Chassis equipped, $2100.

Fill Immediate ACME Orders!

DEALERS: Get the quick, profitable business of local truck buyers who know the advantages of ACME Trucks and want them **for early delivery.** The **surest selling features** to meet customers' requirements for from 1-ton to 3-ton capacities.

Clinch the ACME Agency now—and sell **easily, with substantial profit.** No large service to render because of fifteen famous "Proved Units" from radiator to tail light. ACMES have oversize dimensions. The 2-ton ACME has powerful 40 H. P. Continental Motor and big capacity—Chassis, equipped $2100.

ACME
THE TRUCK OF PROVED UNITS

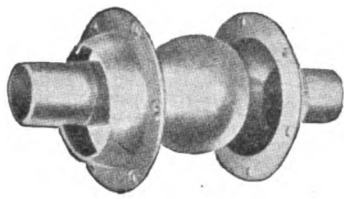
Be in a position to accept big business on our One-Ton Truck. Announcement and specifications sent on request. An all-feature worm drive ACME —$1500.

Write for Booklet, "A Business Builder," and Territorial offer today. Or WIRE—

Cadillac Auto Truck Co.
12 Mitchell Street
CADILLAC, MICHIGAN

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BOSSERT

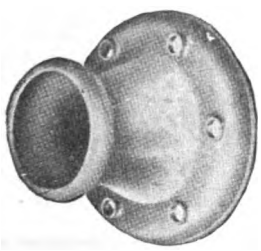


In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice.

We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

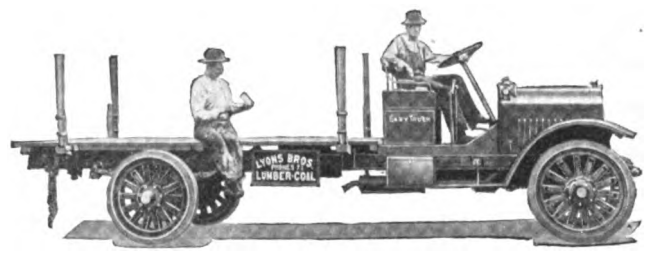
"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



The Bossert Co.
UTICA
N. Y.

The
Gary Motor Truck Company
Manufacturers of
Gary Worm Drive
MOTOR TRUCKS



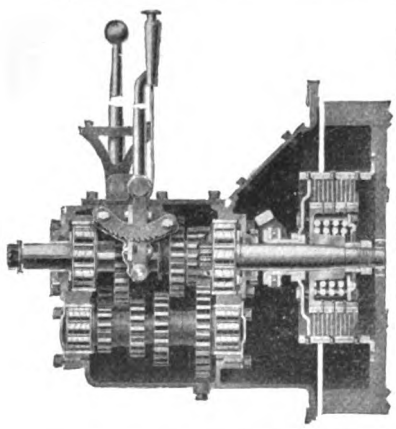
5 MODELS *5 CAPACITIES*

¾ Ton 1 Ton 1½ Ton 2 Ton 3 to 3½ Ton

Complete 1917 Catalog will be mailed Promptly on Request

General Offices:
GARY MOTOR TRUCK COMPANY
610 BROADWAY *GARY, INDIANA*

COVERT COVERT COVERT
TRANSMISSIONS



Made in various models for different sizes and types of cars—Covert Transmissions will free you from transmission troubles. Let us show you how they fit your construction.

Covert Gear Company, Inc.
Sales Office, Detroit, Mich.
Factory, Lockport, N. Y.

Handle Your Time Sales on the
Guaranty Time Payment Plan



Guaranty Securities Corporation
Equitable Building, New York City
San Francisco, Hobart Building
Montreal, National Trust Company

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NORTH AMERICAN MOTORS

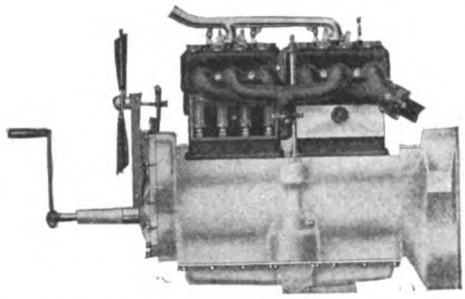
This is to announce two new models which have been added to the "N. A." line. They are: Model C, developing 20-25 H.P., and Model CX, developing 25-30 H.P.

These motors round out a line of power plants for commercial vehicles which are the most thoroughly accessible and simplest truck motors ever designed.

Full information on these new models or on our entire line will be gladly sent.

A Detroit office has been opened at 1325 Dime Savings Bank Building.

NORTH AMERICAN MOTORS COMPANY
Factory: POTTSTOWN, PA.
Detroit Office: 1325 Dime Savings Bank Bldg.



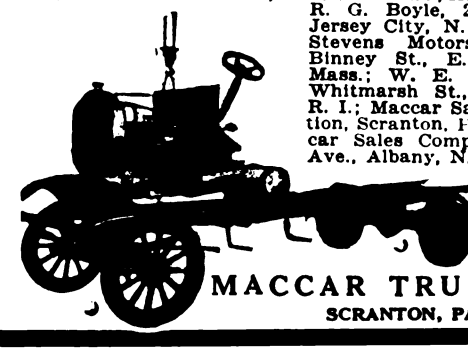
MACCAR

Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.
If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.
The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.
Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.

Distributors:

Pitts Motor Car R & S Corp., 540 Atlantic Ave., Brooklyn, N. Y.: Maccar Sales Co., 2116 Market St., Philadelphia, Pa.; Bee Automobile Co., 15 N. Church St., Allentown, Pa.; R. G. Boyle, 210 10th St., Jersey City, N. J.; Britton-Stevens Motors Corp., 52 Binney St., E. Cambridge, Mass.; W. E. Higgins, 151 Whitmarsh St., Providence, R. I.; Maccar Sales Corporation, Scranton, Pa.; The Maccar Sales Company, 7 Pine Ave., Albany, N. Y.



MACCAR TRUCK CO.
SCRANTON, PA.

DIAMOND T

TRUCKS

Diamond T Service is as thoroughly built into our ¾-ton trucks, the smallest of the line, as it is in our 3½ ton model.

Its low cost is made possible only by its wide popularity which has enabled us to produce this model in enormous quantities. There has been no cheapening of quality or inferior workmanship permitted in its design or construction.

For a thousand uses it is the most satisfactory and economical delivery vehicle ever marketed. With a body suited to your requirements, it will improve your delivery service while lessening your operation expense.

Write to-day for catalog.

Diamond T Motor Car Co., Chicago, Ill.



United States 'Solid Truck' Tires

Truck Tire Efficiency

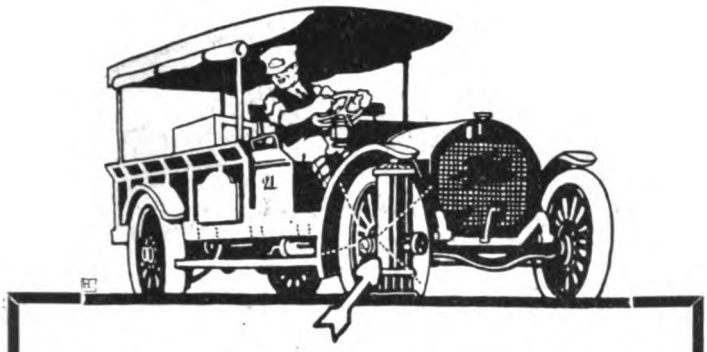
Our new, secret process compound, vulcanized under a pressure of 1,600,000 pounds (almost four times the pressure used to vulcanize ordinary truck tires) has more vitality, rugged strength and durability than any other compound manufactured.

For this reason, United States Solid Truck Tires are the strongest and most durable now on the market.

United States Tire Company
1790 Broadway, New York City

US
UNITED STATES RUBBER COMPANY AND ASSOCIATED COMPANIES

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Wouldn't it be fine!

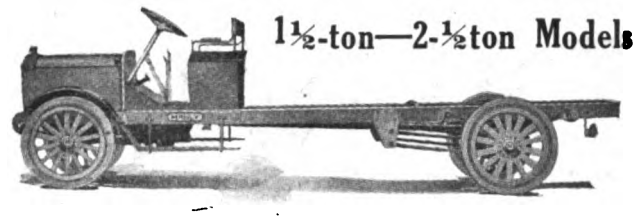
If every part of your truck were guaranteed indestructible—wouldn't it be fine!

TRADE **DREADNAUGHT** *Indestructible* **Hub Odometer** MARK

is the only hub odometer with this iron-clad guarantee—"a new one free if you break it, no matter how." It gives reliable, uninterrupted mileage records, so that you know your delivery costs. Figures easy to read—always right-side up and can't be obscured by grease or dust.

Write for booklet and prices.

AMERICAN TAXIMETER COMPANY
Manufacturers of Jones and Popp Taximeters
1765 Broadway **New York City**



1½-ton—2-½ton Models

America's New Quality Truck Has 20 Remarkable Features—

features proven in the fire-test of actual service to be of money-saving merit to users and sales creative value to dealers. These set MANLY Trucks in a class far up among quality commercial vehicles.

MANLY TRUCKS

Wire or write for advance information or visit our factory. Handsomely illustrated catalog sent on postal request.

Territorial arrangements now being made for early deliveries

MANLY MOTOR CORPORATION
WAUKEGAN **ILLINOIS**
1432 Michigan Avenue **Chicago, Illinois**

Standard

MADE IN DETROIT USA

Motor Trucks

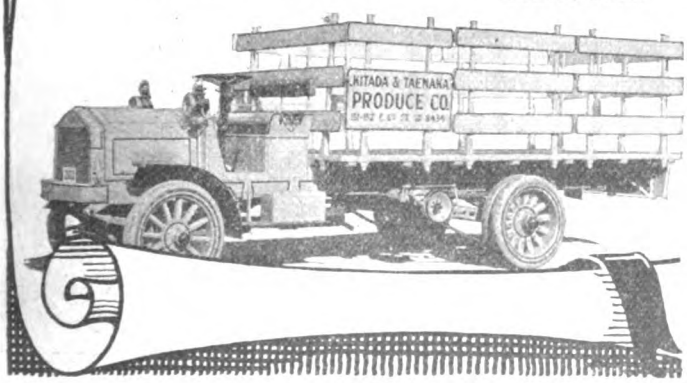
Startled the Motor Truck Industry By a Unique Sales Plan

First of all, the Standard is an unusual truck. It is a powerful combination of many of the world's best-known units—the Continental Motor; Timken Axles; Timken Bearings; Brown-Lipe Gears, and other well-known standard parts.

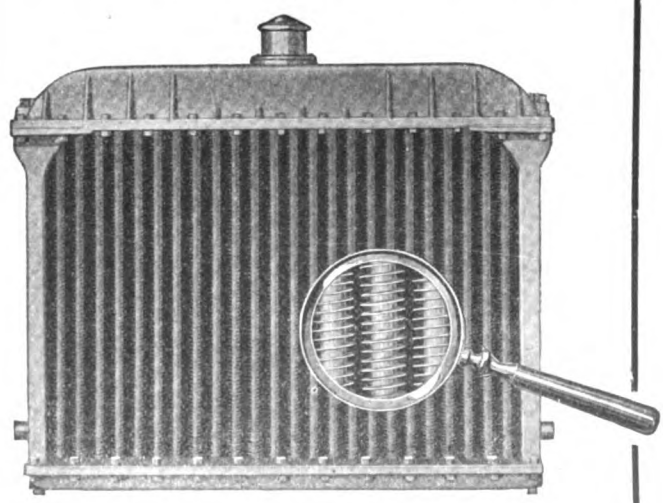
The Standard Motor Truck is sold in an unusual way. Any responsible person can be the agent for the Standard, with absolutely *no investment—no deposit* and *no contract.*

Write for details of this plan. No obligation.

STANDARD MOTOR TRUCK CO., 315-327 Bellevue Ave. Detroit, Mich.



Seamless Copper Helical Tube Cooling Sections



Are Guaranteed for the Life of the Motor on Which They are Installed

Helical Tube Construction is Accepted as the Best by the Leading Truck Makers of America

Manufactured only by

ROME-TURNEY RADIATOR CO.
ROME, NEW YORK

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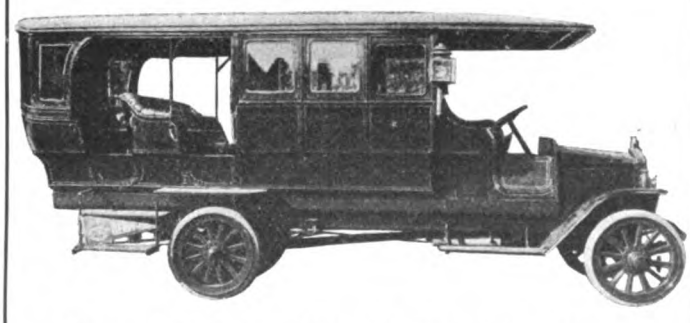
DENBY
TRUCKS
FOR TRAIL OR PAVEMENT

THE Denby Motor Truck was a pioneer of the internal-gear drive; and the wonderful endorsement which has since been given the internal-gear is due largely to the performance of Denby trucks in the service of owners.

Buyers appreciate Denby dependability—any Denby dealer will tell you so. And we'll be glad to discuss with you the Denby possibilities in your territory.

Write us about them.

Denby Motor Truck Company
Dept. K, Detroit, Michigan



Four Models—1 to 2½ tons in rating



The Great Factors in Hauling

—Continuous Operation—Low Maintenance Cost—Maximum Mileage—

Firestone
Truck Tires

—of any kind on any vehicle—make it give better results with longer life and lowest expense per mile. Write for details of the right Firestone Equipment for all roads, loads and conditions.

Firestone Pressed-On Tires are applied under enormous pressure at any Firestone Service Station. Write for further particulars and dealer co-operation.

Tires for Trailers

Every type—heavy and light—brought to highest degree of perfection. See the Firestone service man.

Firestone Tire and Rubber Company
"America's Largest Exclusive Tire and Rim Makers"
Akron, Ohio—Branches and Dealers Everywhere

1000 Pound Capacity
Sheridan Commercial Car
Ready for Delivery Now

Fully Equipped Price $540

THE SHERIDAN is the lowest priced delivery car on the market. Thoroughly equipped and properly built to do the work it's designed for—haul 1000 pounds any time—anywhere. Ample in size, load capacity and power.

Sells fast to a big, ready-made field of *buyers*. Not a rebuilt pleasure car. Made a truck through and through by manufacturers of trucks, to replace horses where price is what counts. Chassis alone, **$490.** Fully equipped, **$540.** Write or wire for complete details. Make territorial reservations now. Dealers make good.



For prompt attention address desk **14**
SHERIDAN COMMERCIAL CAR CO.
1509 Michigan Ave.
CHICAGO
Factories: Harvey, Ill.

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Veeder Hub Odometer

The check on the upkeep of your truck. For the basis of all accurate truck records is necessarily absolutely accurate mileage. Get this from a Veeder Hub Odometer.

You should audit your truck expense by means of a Veeder Counter and bills. With the accurate mileage and your exact costs you can *know* whether you are getting the service you should from your tires, your gasoline, etc. Do you *know* now?

Price complete, $20. Special model for Ford cars, $15.

Cyclometers for Bicycles and Motorcycles. Odometers for Automobiles and Horse Drawn Vehicles. Counters for practically every purpose. Tachometers, Tachodometers and Fine Die Castings.

VEEDER MFG. CO.
54 SARGEANT STREET
Hartford - Conn.

NEVER-LEAK
Copper Asbestos-Filled
GASKETS

Get your estimate on your next gasket requirements. You will be agreeably surprised.

For producing absolutely gas-tight joints nothing has ever been invented to compare with Never-Leak Gaskets. You can protect yourself from all worries over compression leaks if you fully equip your motor with these Copper Asbestos-Filled Gaskets.

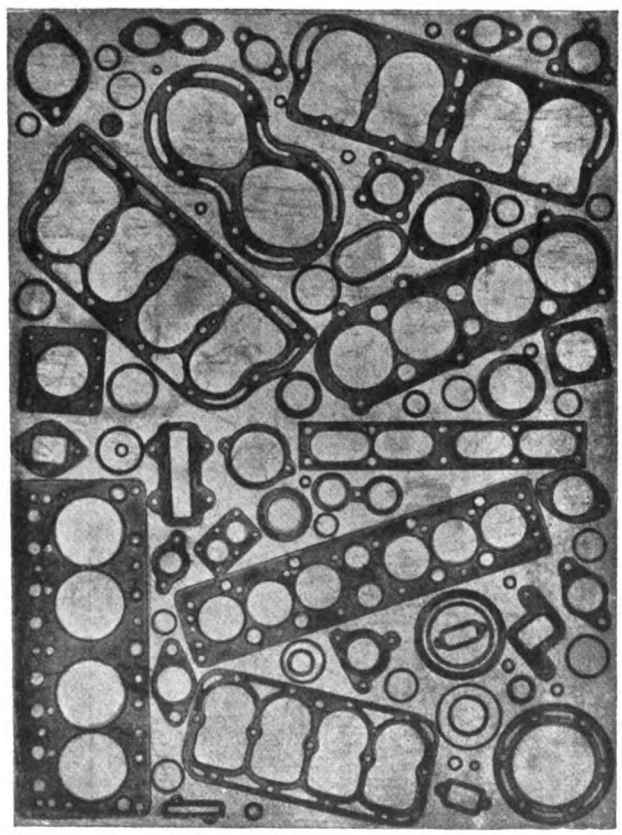
The copper gives malleable metal contact surfaces. The asbestos secures a body which retains a powerful spring under compression.

If you have gasket trouble of any nature consult our Engineering Force. This will involve you in no obligation or expense.

Write for our estimates. We are equipped with many thousand special dies such as here shown and can readily produce the gaskets you need.

Have "Never-Leak" on every gasket.

The Fitzgerald Mfg. Co.
TORRINGTON, CONN.
Gasket Dept.



MONARCH

Limits the Speed and the Expense

The only Governor designed solely for internal combustion engines.

Both automatic and manual control is through the Monarch Governor throttle—the throttle of the carburetor being removed.

It is impossible to wedge open the throttle (a practice so common among truck drivers with other types of governors) as any attempt to tamper with the Monarch Governor disables the engine.

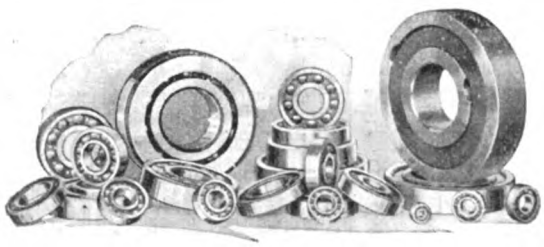
The Monarch Governor is the only one that cannot be tampered with and continued in service. The owner of the truck holds the padlock key and no alteration can be made without his knowledge.

Write us about 30-day trial on your truck. Literature also gladly sent.



MONARCH GOVERNOR CO.
Detroit, Michigan

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Quality— In Quantities

The New Departure Manufacing Company has rendered a distinct service in making possible the production of high quality ball bearings in quantities sufficient to enable American car manufacturers to meet increased production demands without sacrificing any part of standardized quality.

This would have been impossible without correct principles of ball bearing design; the proper steel and a perfected plant and organization for turning out rapidly ball bearings so uniform that micrometers cannot detect any difference in dimension truth nor microscopes any variation in the structural essentials of the steel.

THE NEW DEPARTURE MFG. CO.
Bristol, Ct. Detroit, Mich.

NEW DEPARTURE BALL BEARINGS

AMERICAN MADE FOR AMERICAN TRADE

PARK COUNTERBALANCED

(Pat. applied for)

We have shipped 32051 Counterbalanced Crank Shafts up to January 10, 1917



THE PARK DROP FORGE COMPANY
Cleveland

Real Value

THE KREBS COMMERCIAL CAR CO. CLYDE, OHIO U.S.A.

You get the full value of your money and more when you invest in a KREBS Truck.

Guaranteed by manufacturers with 16 years' experience in motor vehicle construction, the KREBS combines Simplicity and Low Maintenance with Efficiency and Reliability.

It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault-type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

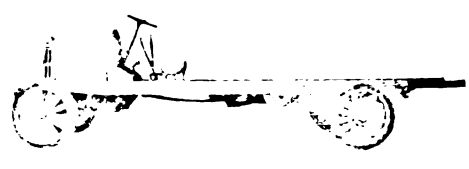
Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.

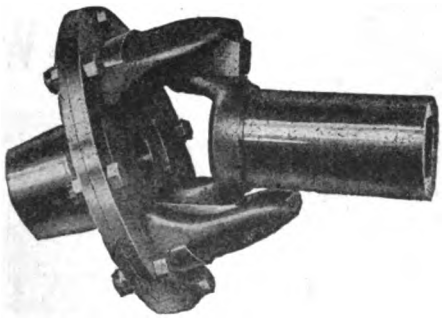
KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.

Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.



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"EVANS"
UNIVERSAL JOINTS
Pat. Pending

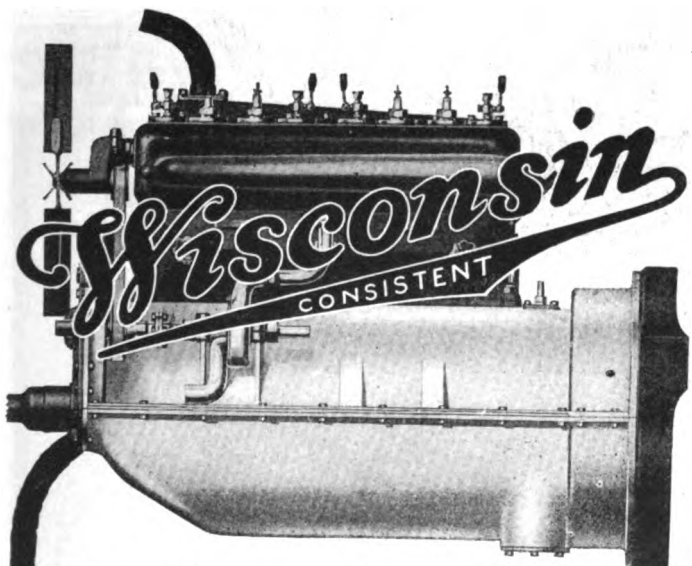
Simply constructed with a minimum number of parts this joint works smoothly and easily within a dust-proof housing, which holds grease to lubricate the working parts. The Evans Universal Joint consists essentially of two hardened trunnion blocks of large area running in spherical slots and acting also as a bushing for the right angle hinge motion. Made in four sizes up to 100 H. P.
Booklet and further information upon request to Dept. "*B-21*"

"M. & E." Grease Cups "Hele-Shaw" Clutches

MERCHANT & EVANS CO.
PHILADELPHIA

New York
Baltimore
Atlanta
Cleveland

Wheeling
Chicago
St. Louis
Kansas City



The More a Man Knows

about motors the higher is his opinion of the Wisconsin. In design, in materials, in workmanship, Wisconsin Consistent Motors are unexcelled. Our attention is fixed on keeping the quality up, not on speeding production up.

Write for specifications of motors for pleasure cars, trucks or tractors.

Wisconsin Motor Mfg. Co.
Sta. A. Dept. 319 Milwaukee, Wis.

New York Branch: 50 Church St.
T. M. Fennerm, Factory Representative.

Pacific Coast Distributor: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles St., Los Angeles, Cal.

THE MARK OF A BETTER RADIATOR

G & O
Radiators
for
Heavy Duty Service

The G & O Mfg. Co.
New Haven Connecticut

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AUTOCARS
are equipped with the
"JASCO" TANK

Why? Because demonstrated service facts have proven that this gasoline receptacle makes fuel absolutely safe from fire or explosion and devotes every drop to energy.



"JASCO" TANKS are made of drawn steel. They are seamless, tinned and tested and positively cannot spring a leak even under the most severe conditions. They are money savers, life and property protectors. If your car is equipped with an old fashioned riveted tank you are courting danger. Investigate the "JASCO" today. Full details on request.

The "Jasco" Tank is used and indorsed by the following prominent manufacturers:

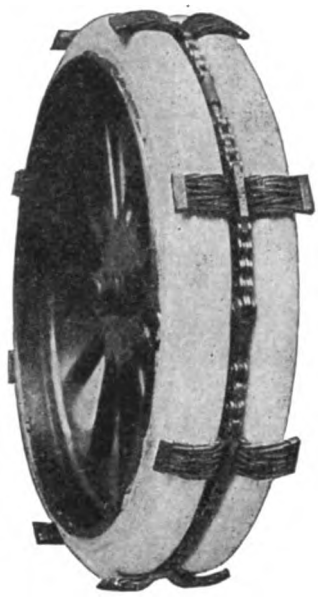
PLEASURE CARS

Biddle Motor Car Company, Simplex Automobile Company, Mercer Automobile Company, Lozier Motor Company, Stanley Motor Cariage Company, James Cunningham Son & Company, H. H. Franklin Mfg. Company.

TRUCKS

Baldwin Locomotive Works, Autocar Company, General Vehicle Company, H. G. Burford Company, Peerless Motor Car Company, Garford Motor Truck Company, Gramm Motor Truck Company, Thomas Auto Truck Company, Motor Trucks, Ltd., Canada.

JANNEY, STEINMETZ & CO.
Main Office: PHILADELPHIA
New York Office: HUDSON TERMINAL BUILDING



Don't Wait

until the streets are covered with ice and snow, before getting "NEVER - SKIDS" for your motor trucks.

THE NEW TYPE
NEVER-SKID
practically eliminates vibration

Does away with skidding and affords positive traction on slippery streets. The cross-pieces are made of the finest quality woven steel wire — **strong** enough for the heaviest machines made.

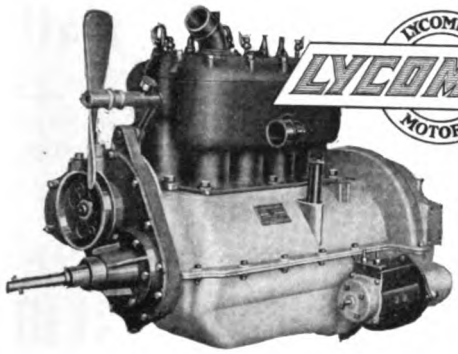
The device can be applied in a few minutes without jacking up the truck, and there is no danger of its catching in driving chains or damaging tires.

YOU WILL SURELY NEED "NEVER-SKIDS" this winter.
Why not get them now?
Folder and prices will be gladly sent

NEVER-SKID MFG. CO.
122 Liberty Street, New York, N. Y.
New England Distributor: WILLARD B. DAVIS, 30 Danforth Street, Fall River
Chicago Distributor: FRED ALLEN AUTO SUPPLY CO., 1610 S. Michigan Avenue



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Nothing in the World like it -for Power-

Lycoming Foundry & Machine Co.
Williamsport, Pa.

"Little Giant"



The Power-Bred Truck

MECHANICAL power is bred into the Little Giant Trucks of today—just as strength and endurance were bred into the Percherons of the past. The Little Giant is lively, responsive, like a fine-spirited horse—yet, like a young Mogul Locomotive, it is dependable twenty-four hours in twenty-four. Thousands of Little Giant owners proudly boast—"it never had a tow-rope on it yet."

THE "LITTLE GIANT" LINE INCLUDES

Model 15—1-ton Worm Drive
Model H—1-ton Chain Drive
Model H—1½-ton Chain Drive
Model 16—2-ton Worm Drive

Special Bodies for Every Purpose

Agents wanted for desirable territory

CHICAGO PNEUMATIC TOOL COMPANY
1085 Fisher Bldg. CHICAGO **52 Vanderbilt Ave. NEW YORK**
Branches and Service Stations Everywhere

DUPLEX
THE ORIGINAL
4 WHEEL DRIVE

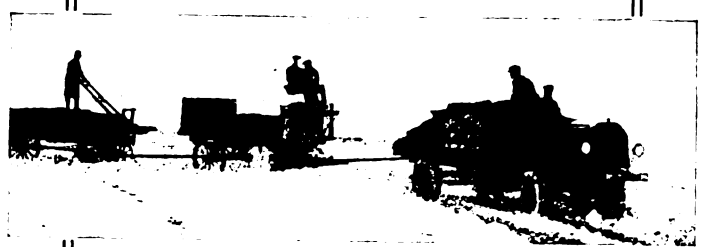
Do you want a heavy hauler that will climb an icy embankment, or pull through sand and mud up to the axles, with a 3½-ton load.

Do you want a heavy duty truck that will go and keep going where no rear-drive truck can follow? That can't be stuck as long as any one of its four wheels can find traction? That will haul two or more trailers?

Send for your copy of the new 1917 Duplex catalog. It tells why the Duplex meets your requirements. It explains in detail why the even Duplex application of power to all four wheels keeps down the fuel consumption, saves tires, and cuts repair bills to the minimum.

$1,000,000 was raised in 48 hours recently to build new plants to make more Duplexes to answer the demand from contractors, oil men, the U. S. government, mining, construction, and engineering companies. Our production has been tripled in the last two months; and will be doubled again upon the completion of new plants.

DUPLEX TRUCK COMPANY
LANSING MICHIGAN



Duplex hauling its own load and trailers on snowbound wagon trail over badly cut sand loam near Denver, at altitude of 5,000 feet

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A Service Feature of International Motor Trucks



EXCEPT perhaps the engine, no single part of the motor truck you buy deserves closer study than the rear axle. The useful life of the truck depends largely upon the behavior of this important member. The one piece type, with chain drive, has the advantages of strength and lightness. The shaft drive has the advantages of neatness, silence, and protection of the drive gears. The *International* rear axle combines the advantages of both types and does away with their disadvantages.

A heavy one-piece forging carries the load. A shaft drive delivers the power of the motor to the rear wheels through an internal gear. The axle is as strong as a chain drive axle, yet is much lighter than the usual shaft drive type, and gives more road clearance. The internal spur gear, also, outwears every other form of drive, and is the one that behaves best if your driver should ever be careless about oiling it.

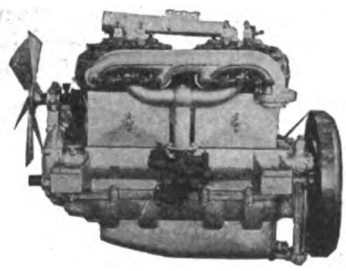
The rear axle is only one of many first-class features of *International Motor Trucks*. We want your order, but we want it only on the basis that an International Motor Truck will give you better service and prove to be a better investment than any other truck you can buy. Write and tell us which of these two models comes nearest to your requirements, and we will send you complete description.

Model H—1500 lbs. capacity, chassis, $1225 cash f.o.b. factory
Model F—2000 lbs. capacity, chassis, $1500 cash f.o.b. factory

International Harvester Company of America

(INCORPORATED)

88 Harvester Building **Chicago U S A**



Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications.

BEAVER MFG. COMPANY

Milwaukee **Wisconsin**



Dealers find United Trucks a most profitable line because they meet **every** demand for **heavy-duty hauling.**

Their past records of efficiency make it a simple matter to demonstrate to prospective purchasers exactly how United Trucks will handle a maximum tonnage at the lowest possible cost.

Made in 2½, 3, 4 and 5-ton sizes—all worm-drive. For our co-operative dealers' proposition, address

UNITED MOTORS CO.

672 North St. Grand Rapids, Mich.

United Trucks

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Announcing
INDIAN TIRES
for TRUCKS

The Guarantee	The guarantee that accompanies an Indian Tire of course covers as great a distance as that of any other tire made. But we do not expect to sell Indian Tires merely on the big mileage shown in the guarantee.
The Big Mileage	The big mileage is built into the Indian Tire by men who have proved their ability by building, for others, some of the farthest traveling heavy duty tires made.
Long Experience	Long experience, with leading makers of truck tires, has equipped the designers and builders of the Indian Tire with the knowledge and skill necessary for building tires of the highest possible character.
Extremely High Quality	The extremely high quality of the Indian Tire will soon be a matter of common knowledge. It is of a character to command attention—to win respect and confidence.

INDIAN TIRE & RUBBER COMPANY

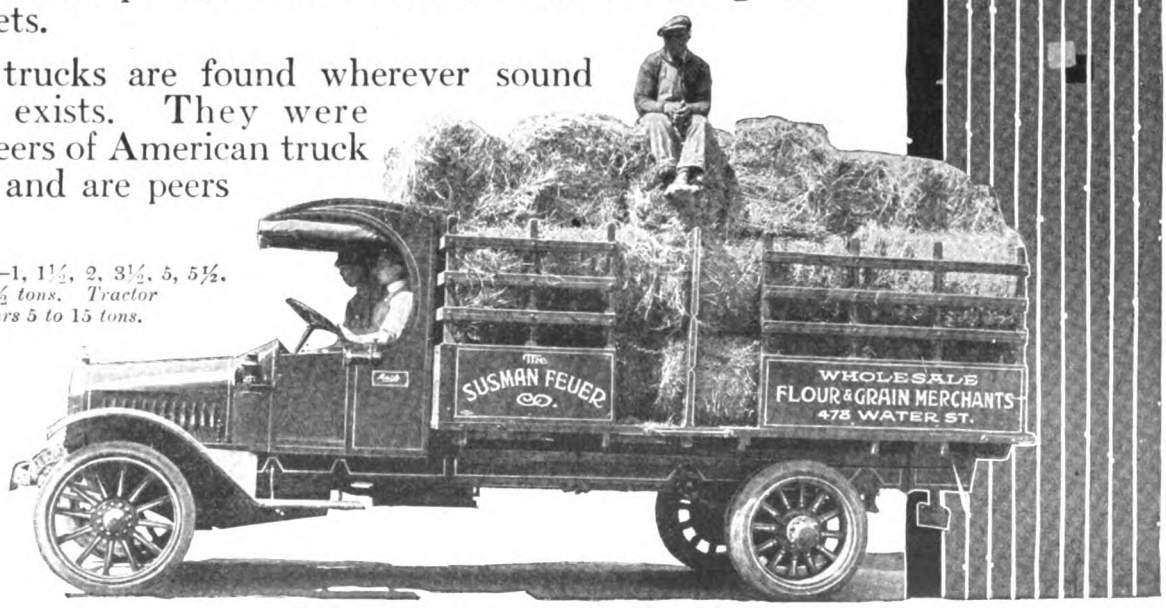
New Brunswick New Jersey

Mack TRUCKS

MACK worm drive trucks of 1, 1½ and 2 ton capacities serve an infinite variety of purposes. They are light, powerful, flexible trucks, equally suited for hauling ordinary farm products or the most mixed tonnage of city streets.

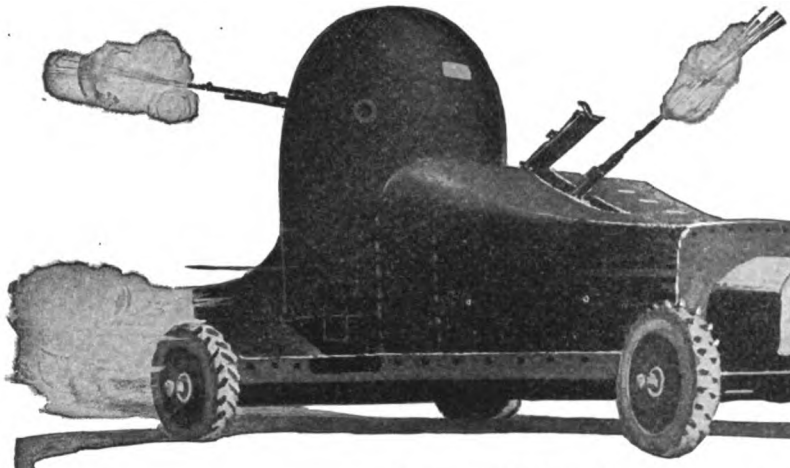
MACK trucks are found wherever sound business exists. They were the pioneers of American truck industry and are peers today.

Complete line—1, 1½, 2, 3½, 5, 5½, 6½, 7½ *tons. Tractor trailers 5 to 15 tons.*



International Motor Co. New York

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Real Protection for Your Motor!

To protect it from ignition troubles of any kind install an

EISEMANN MAGNETO

You'll be sure of full power from every explosion; the intensely hot spark—**even at very low speed**—takes care of that!

You'll have ignition you can depend upon—easy starting—sure fire even though the mixture be very rich or very lean—that's the Eisemann Reputation.

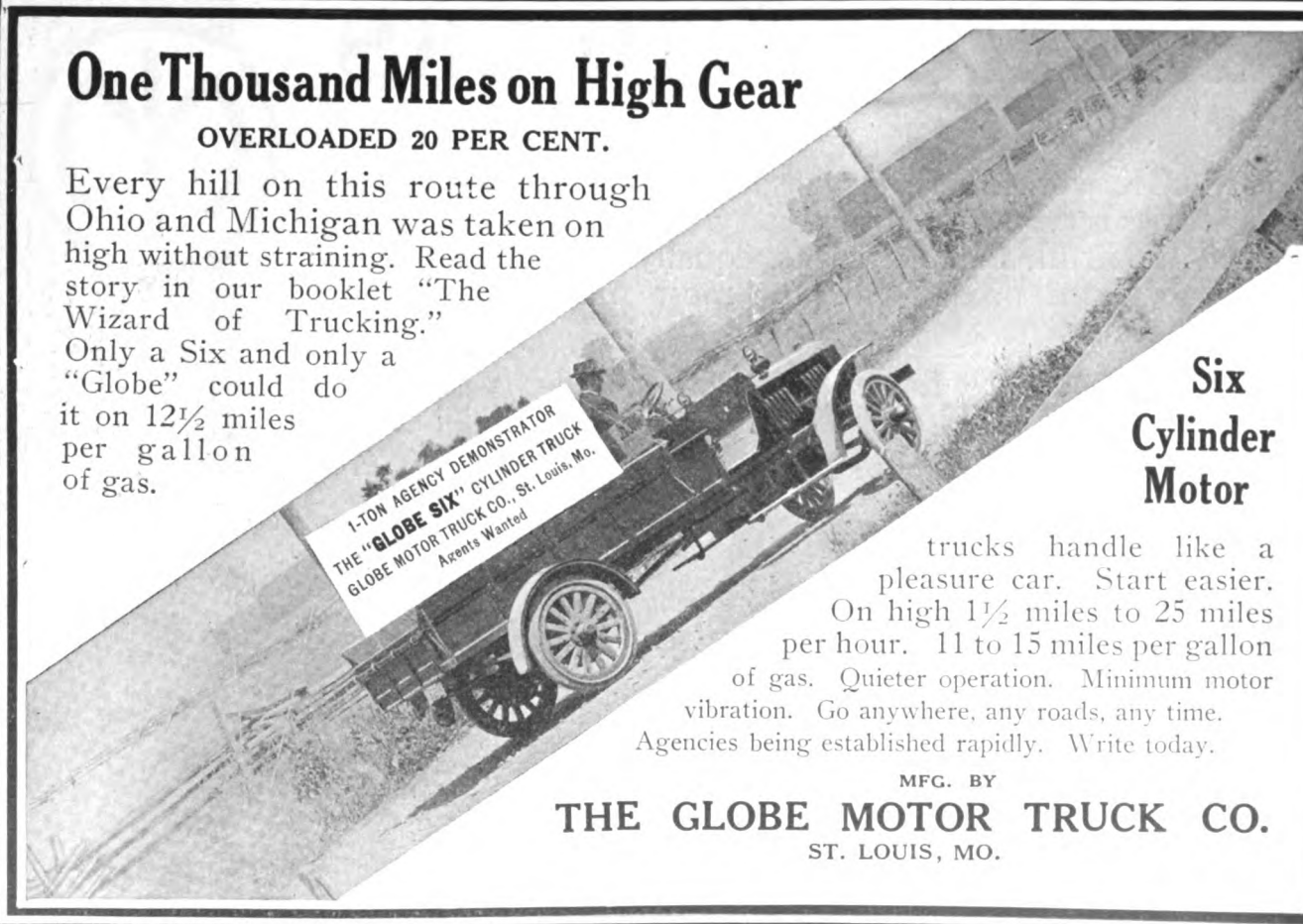


THE EISEMANN MAGNETO COMPANY
Sales and General Offices, 32-33d St., Brooklyn, N. Y.
Detroit, Mich., 802 Woodward Ave.

One Thousand Miles on High Gear

OVERLOADED 20 PER CENT.

Every hill on this route through Ohio and Michigan was taken on high without straining. Read the story in our booklet "The Wizard of Trucking." Only a Six and only a "Globe" could do it on 12½ miles per gallon of gas.



Six Cylinder Motor

trucks handle like a pleasure car. Start easier. On high 1½ miles to 25 miles per hour. 11 to 15 miles per gallon of gas. Quieter operation. Minimum motor vibration. Go anywhere, any roads, any time. Agencies being established rapidly. Write today.

MFG. BY
THE GLOBE MOTOR TRUCK CO.
ST. LOUIS, MO.

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GMC Trucks Win Highest Rating

In City of Chicago Competitive Test For Trucks

When the City of Chicago buys Motor Trucks the Commissioner of Public Works is instructed to ask for bids and to award contracts to the manufacturer showing the highest rating based on the following points:

1—Price.
2—Service Facilities.
3—Inspection and Testing of Parts and Material.
4—Practical Experience with Truck by Others.
5—Responsibility of Manufacturer
6—Comparative Cost of Repair Parts.
7—Motor.
8—Clutch.
9—Transmission Gear Set.
10—Final Drive.
11—Axles.
12—Frame.
13—Springs.
14—Wheels and Size of Tires.
15—Brakes.
16—Steering Gear and Arrangements.

The trucks are given a comparative marking on the basis of 100 points made up from the above sixteen important features.

The last three purchases of motor trucks by the City of Chicago were awarded to the General Motors Truck Company over all competitors, for in three successive tests GMC received the highest rating. Read the requirements again carefully. The City of Chicago is buying motor trucks on the basis of actual merit.

Write for complete information regarding the performance of GMC trucks now used by cities and towns throughout the country.

"Let your next truck be a GMC"

GMC Trucks are Built in Six Sizes. ¾- to 5-Ton Capacity

New York, Boston, Chicago.

GENERAL MOTORS TRUCK COMPANY

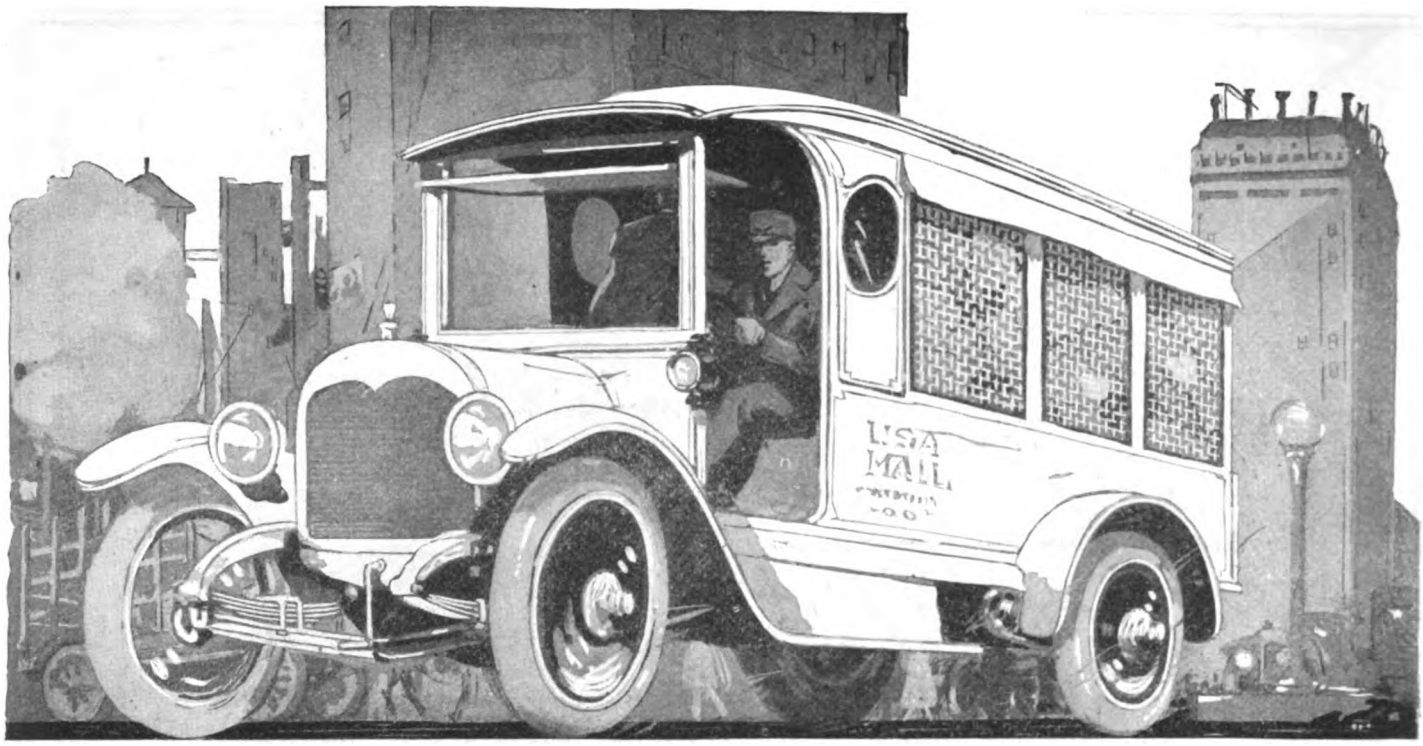
One of the Units of the General Motors Company

Philadelphia, St. Louis.

PONTIAC, MICHIGAN

(150)

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Dealers—Get the Benefit of This

Smith Form-a-Truck

$350

F. O. B. CHICAGO

Smith Form-a-Truck dealers are the biggest single factors in motor truck service in their territory.

Smith Form-a-Truck has been the selling sensation of the past year—the best merchandised motor truck or motor truck attachment.

Sales volume has exceeded that of all other attachments combined and that of any other manufacturer of motor trucks.

Tie up with the colossal sales success achieved by Smith Form-a-Truck—create big business—big profits—big individual success for yourself through the co-operation of big merchandising helps—the strenuous sales efforts that are creating sales in your territory.

Now, Smith Form-a-Truck sales effort has doubled: advertising has doubled: merchandising effort is doubled. Your chance for success and the success of every other Smith Form-a-Truck dealer has increased in proportion.

Live, wide awake, aggressive dealers are the dealers handling Smith Form-a-Truck. You can now furnish Smith Form-a-Truck attachments for Maxwell, Dodge Brothers, Buick, Chevrolet and Overland cars, in addition to the Ford. Think what this means to you in increased sales possibilities—in profit developing new business.

Time is limited in which you can act. Available territory is being snapped up by wire and by telephone.

You must act quickly. Applications for dealerships are being considered strictly in the order that they come in. If you are the dealer best qualified in your territory, you can start selling Smith Form-a-Trucks now at the very start of the big selling season. Start realizing maximum profits—start building up sales. Despite rise in price announced by all other manufacturers, Smith Form-a-Truck price stays at $350. This applies to attachments for all makes of cars on which the installation can be made

The time to act is now.

Smith Motor Truck Corporation

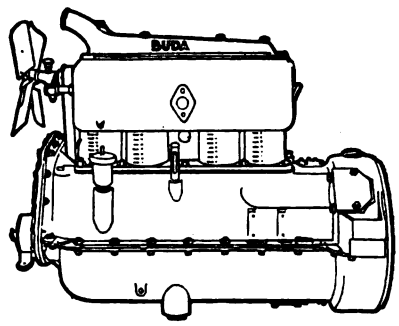
Manufacturers of Smith Form-a-Trucks

Executive Offices and Salesroom, Suite 911 Smith Form-a-Truck Building

1470 South Michigan Boulevard, Chicago

Eastern Branch	*Kansas City Branch*	*Pacific Coast Branch*	*Southern Branch*
1834 Broadway, New York	1808 Grand Avenue	Pico and Hill Streets, Los Angeles	120 Mariette Street, Atlanta

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REPUTATION: It is one thing to have a reputation and sometimes quite another and a very different thing to deserve one.

ESTABLISHED, and therefore deserved, is the high repute of the Buda Motor. It is based on reliable, long-lived, economical, efficient performance, the result of 36 years of the highest grade of manufacturing.

The BUDA MOTOR

is an expression of our one ideal—Quality; and this is attained through conservative engineering plus conscientious workmanship and the fact that—

OUR CAPACITY, though large, has grown solely on the basis of the number of motors we could produce carefully, test thoroughly, guarantee positively. It is kept squarely on that basis. When a BUDA MOTOR goes into your assembly our reputation goes with it. We cannot afford to forget that, and—*neither can you.*

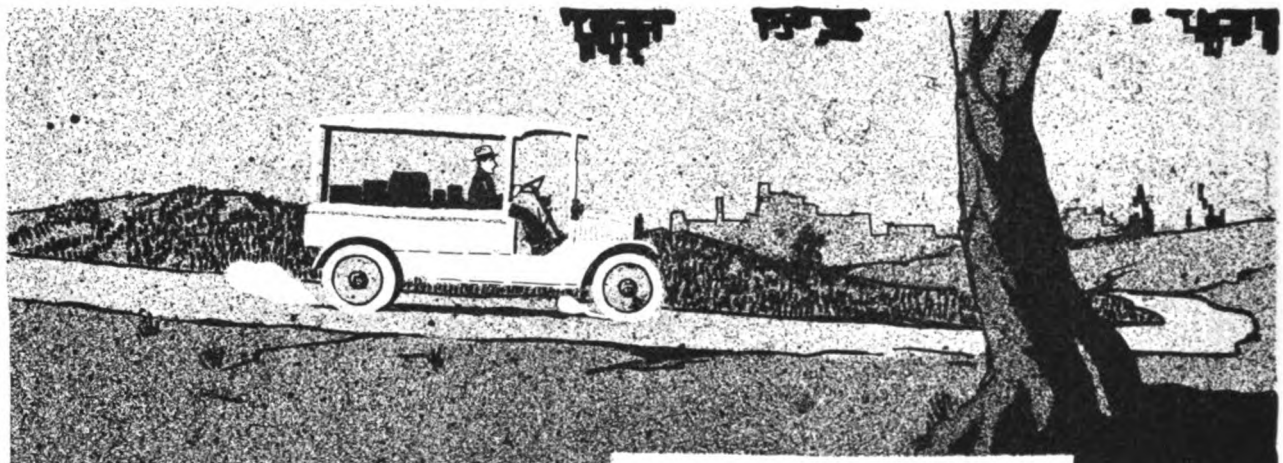
THE BUDA COMPANY, HARVEY, (Chicago Suburb) ILLINOIS

THE BUDA COMPANY
BUDA MOTOR
"The part to buy the car by"
ESTABLISHED 1881

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This new Berling Magneto makes

Motor-trucks Worth More



The Berling Magneto has helped many engines to attain fame in records of endurance as well as speed.

The New Model Berling, E-41, is prepared to do even more—especially for motor-trucks. This Berling will make any motor conspicuous by the absence of that bug-bear—ignition trouble. It will increase the worth of any motor far in excess of its actual cost.

"Worth more than it costs"—that is why the Berling Magneto must appeal to truck-makers.

You will be surprised to find how inexpensive the new 4-cylinder Berling is, as a result of quantity production.

Ericsson Manufacturing Company

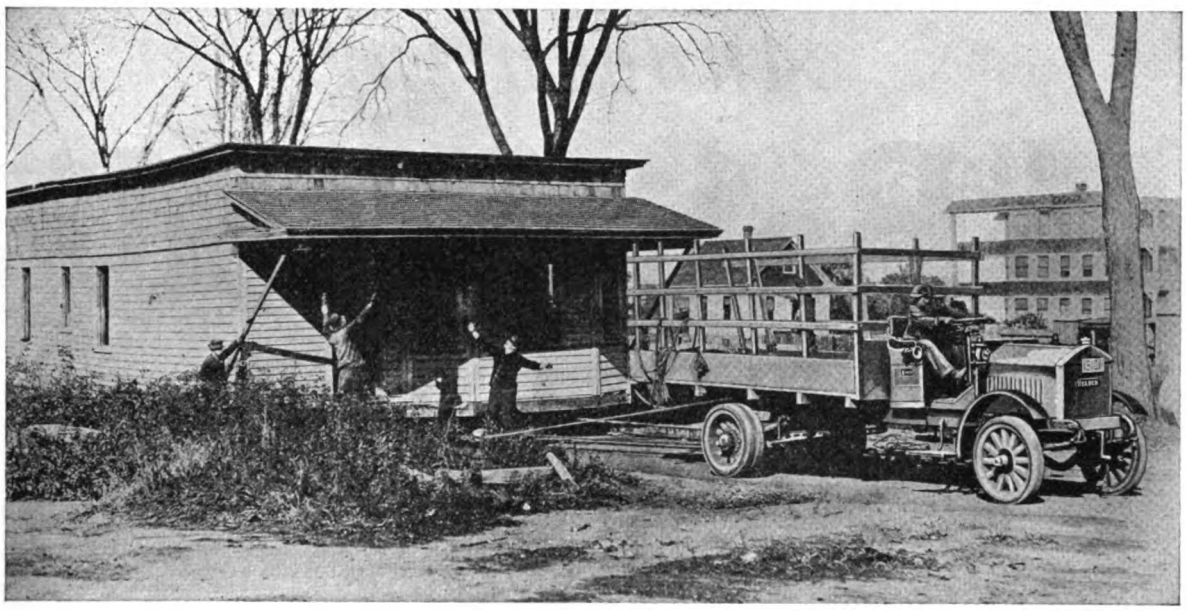
1180 Military Road
Buffalo, N. Y.



Berling Magneto

Worth More Does More

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Near Bridgeport, Conn., several old buildings occupied sites that interfered with the upbuilding of the new Remington City.

The trucking firm of Coleman & Tracy moved these buildings to another part of the town with one of their

SELDEN TRUCKS

in record time and at an amazingly low cost.

The accompanying photograph shows Coleman & Tracy's Model N 3½ Ton Selden Truck doing the job.

The weight of the largest of the buildings—a five room house—was estimated at twenty tons—but, nevertheless, this big, powerful Selden Truck laid right against the rope and pulled the house steadily over the beams, without the aid of rollers, at a rate of speed that, as the Bridgeport Post expressed it, "made the spectators gasp with astonishment."

Dealers: Some day, not very far off, Selden territory will all be closed. We shall have to refuse many a good dealer the opportunity to represent us in his field. Applications for territory are pouring in fast from all sections of the country. Before long we will have all the live, hustling, dependable dealers we want. Why wait until that time, when it will be too late? If you want to build up a profitable truck business write for our new Liberal Dealer Proposition at once.

Selden Truck Sales Co.
Rochester, N. Y., U. S. A.

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Announcing

"The Baby Wood"

HYDRAULIC HOIST

(TYPE "E")

—the lightest,
—the simplest,
—the most positive,
—the quickest-working

And the **most easily installed** dumping device made;

—the inevitable choice—therefore—of the 1917 buyer of light dumping equipment.

Expressly designed for trucks of 2-ton capacity; but equally adaptable to one and 3-tonners.

Supplied with new special model rear-dump body, forming an ideal combination for every manner of light hauling and dumping.

Weight approximately 250 lb.; requires a space of only 13½ inches between body and seat; body arms are outside of chassis frame.

Made to fit any chassis.

With production about to begin on this new model and every indication of a nation-wide demand, we again recommend that prospective buyers of this type of equipment communicate without delay.

Particulars upon request. Address all inquiries to Detroit.

Wood Hydraulic Hoist and Body Co.

Sole Manufacturers

NEW YORK DETROIT CHICAGO

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"BUILT AND SOLD FOR EVERLASTING SERVICE"

DAY-ELDER MOTORS CORP. D WORM DRIVE E NEWARK·N·J·U·S·A

D E

WORM DRIVE TRUCKS

Loom Up Large on The Horizon of Dealers As The Greatest Proposition In Motor Trucks In America Today!

¾-Ton, $975—1-Ton, $1250—1½-Ton, $1500—2½-Ton, $2000

This is sensational—but it's true—and you have only to read the facts about D-E WORM-DRIVE Trucks to realize that they are destined to become the fastest selling line of trucks that the industry has ever known.

No doubt you have read such statements before, and found that they were not based on fact. **But you have an easy way of finding out the truth in this case.**

Investigate the proposition in detail, go over their remarkable specifications carefully—and the conviction will be forced home on you that nowhere in the United States is there a line of trucks of such dominating superiority for the money, or trucks that offer greater selling possibilities.

They say that a good salesman can sell anything; but in selling D-E WORM-DRIVE Motor Trucks your greatest argument is the TRUCKS THEMSELVES. The SELLING FEATURES have been PUT INTO THE TRUCKS—and they are the greatest line of selling features that competition has ever been forced to "buck."

On the other side we unfold the story in detail. Read on.

over

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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Getting right to the very heart of the D-E proposition—What Do You Find?

Plan View of 1-Ton Worm-Drive Chassis

You find, first of all, the huskiest frame you ever saw in trucks at any price—sturdy pressed steel, fabricated in unusually large size. You know how important that is.

Talk about selling features! Go back to the rear ends and look at the MASSIVE WORM-DRIVE rear axles. You'll be "sold" on the spot. Now if you know anything about rear axles at all you know that the WORM-DRIVE is the *logical* drive for a motor truck, for the reason that it not only OUTLASTS any other form of drive, but also because it is more quiet, requires less attention, and delivers 97 per cent of the motor power to the rear wheel contact.

As for the MOTORS, except in the ¾-ton, they are CONTINENTALS—typical TRUCK motors, designed for heavy hauling. Enough said!

We could keep right on going, enumerating feature after feature that would bring your enthusiasm to white heat; but in this limited space it is impossible to give more detailed information. But read on.

¾-Ton D-E Worm-Drive Light Delivery Truck

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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D-E WORM-DRIVE TRUCKS

Put The Truck Business of Your Town Right In The Palm of Your Hand!

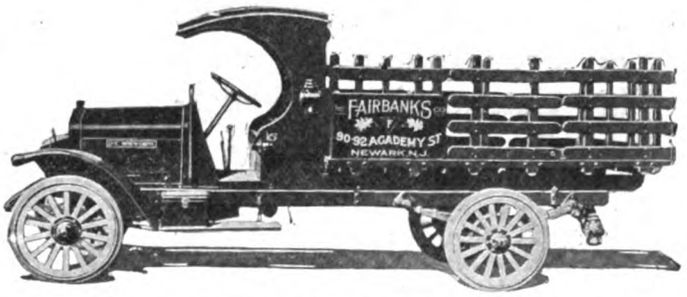
We've tried to give you a brief idea HOW we make D-E WORM-DRIVE Trucks—and from this you can gather what trucks of such indomitable strength can do in actual performance.

We needn't tell you about the possibilities that the motor truck business offers to you. You know it's the coming business. Get in on the ground floor while you can—and reap the profits that enterprising dealers will get.

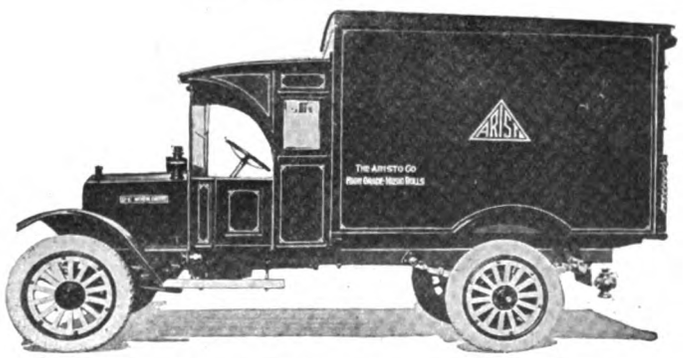
And no other line you can tie to will make profits faster for you than the D-E WORM-DRIVE line. It will put the truck business of your town in the palm of your hand.

Here are the prices that are making D-E WORM-DRIVE Trucks the fastest-selling line of trucks wherever they are introduced:

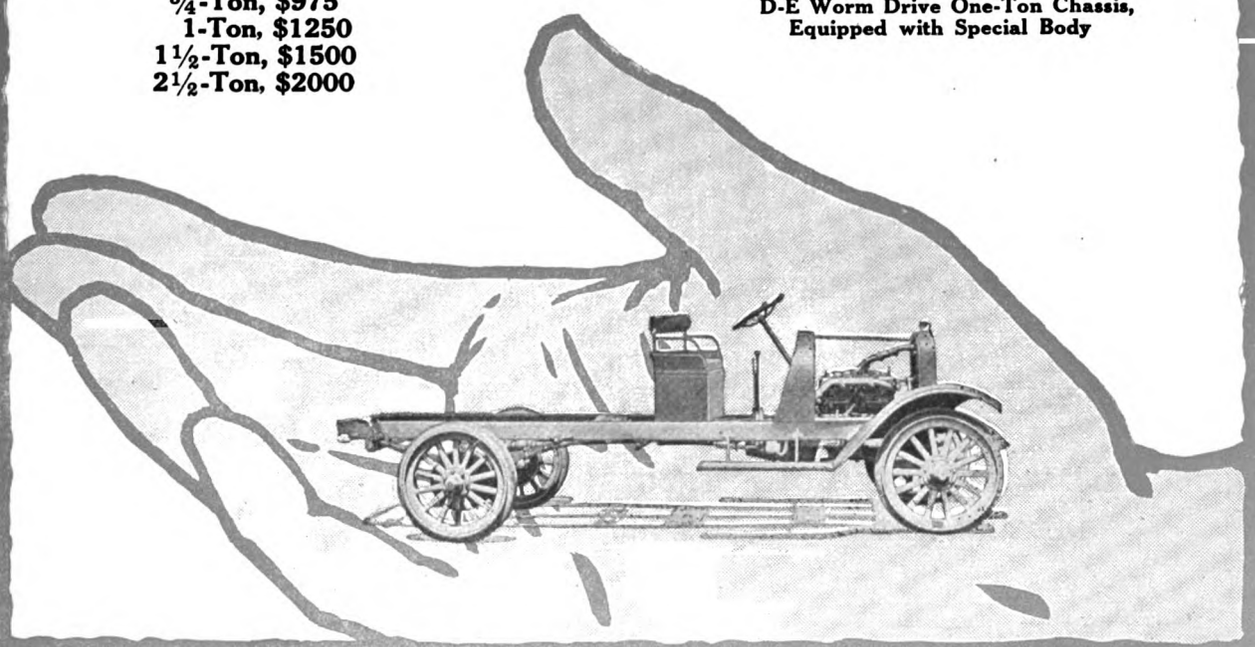
¾-Ton, $975
1-Ton, $1250
1½-Ton, $1500
2½-Ton, $2000



D-E Worm Drive One-Ton Chassis, Equipped with Stake Body and Cab



D-E Worm Drive One-Ton Chassis, Equipped with Special Body



over

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The Big Question Is —

Are You the Man—and Are You Prepared to Embrace This Extraordinary Opportunity?

We are just as particular about the CHARACTER of the dealers whom we want to represent D-E WORM-DRIVE Trucks as YOU are of the KIND of trucks you wish to sell.

Having the most compelling truck proposition in the United States it is only natural that we should want only the most enterprising and substantial dealers to handle them. It means as much to the dealer as it does to us.

And when a dealer takes on the D-E line he gets the closest and the heartiest kind of co-operation from us, and the sort of SERVICE that binds the tie of mutuality between us and makes both parties happy and prosperous.

We provide our representatives with all sorts of dealer helps, such as attractive folders, catalogs, wall hangers, etc.

We still have some very desirable territory open in various parts of the country, and desire to discuss the proposition in detail with those who are qualified to act as our representative.

Write or wire us for complete specifications and dealer proposition TODAY!

GENERAL SALES OFFICES:
1457 BROADWAY NEW YORK
P. K. Hexter, Sales Manager

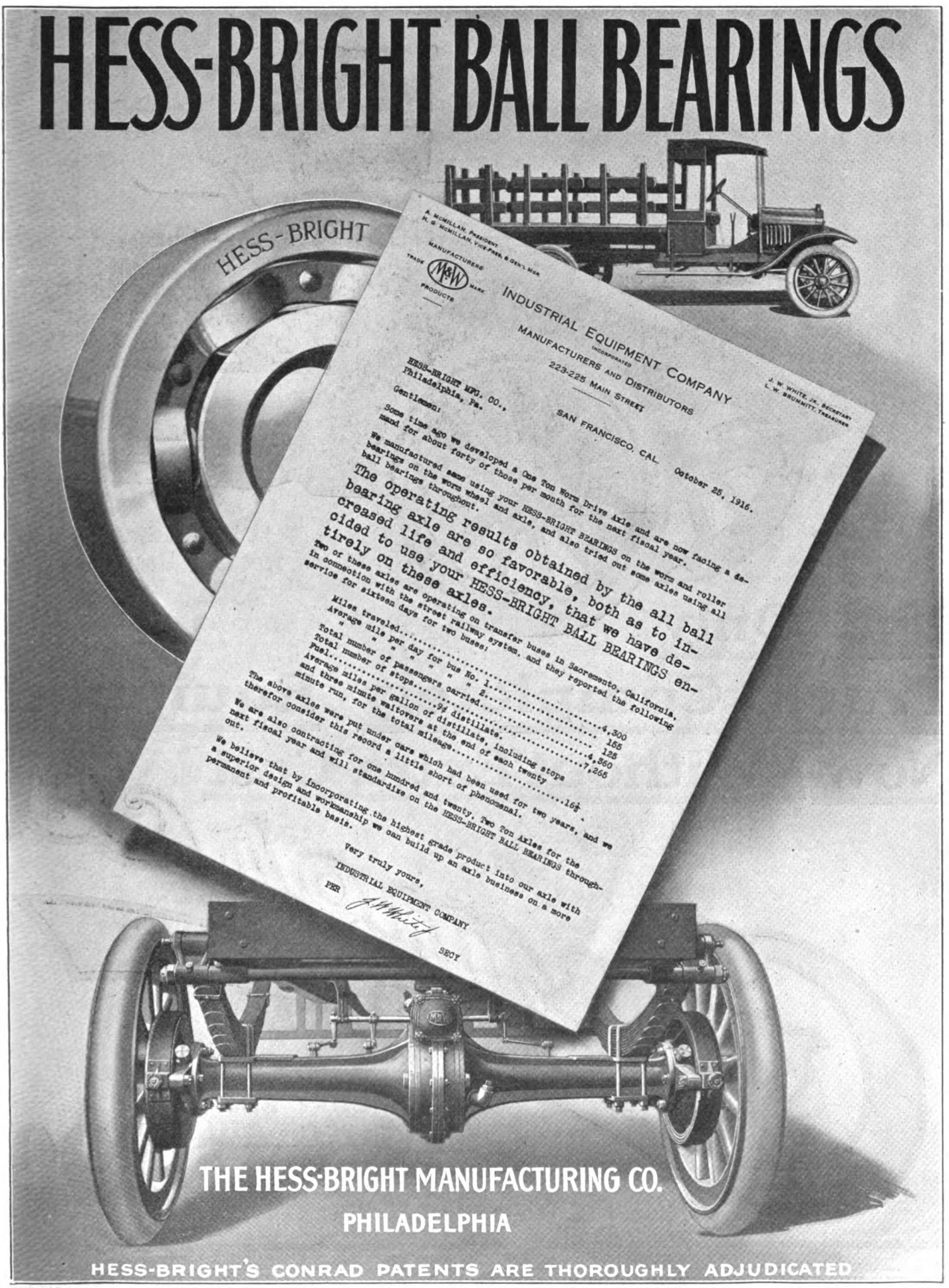
Deliveries Prompt
but
NOTE:
That We Will Commence Delivery On the D-E Worm-Drive 2½ Ton Trucks April 1st, 1917
This is Positive!
The Greatest Value for The Money in The United States at $2000

DAY-ELDER MOTORS CORP.
MANUFACTURERS OF
D-E WORM-DRIVE MOTOR TRUCKS
NEWARK, NEW JERSEY, U. S. A.

DAY-ELDER MOTORS CORP. D WORM DRIVE E NEWARK N·J U·S·A

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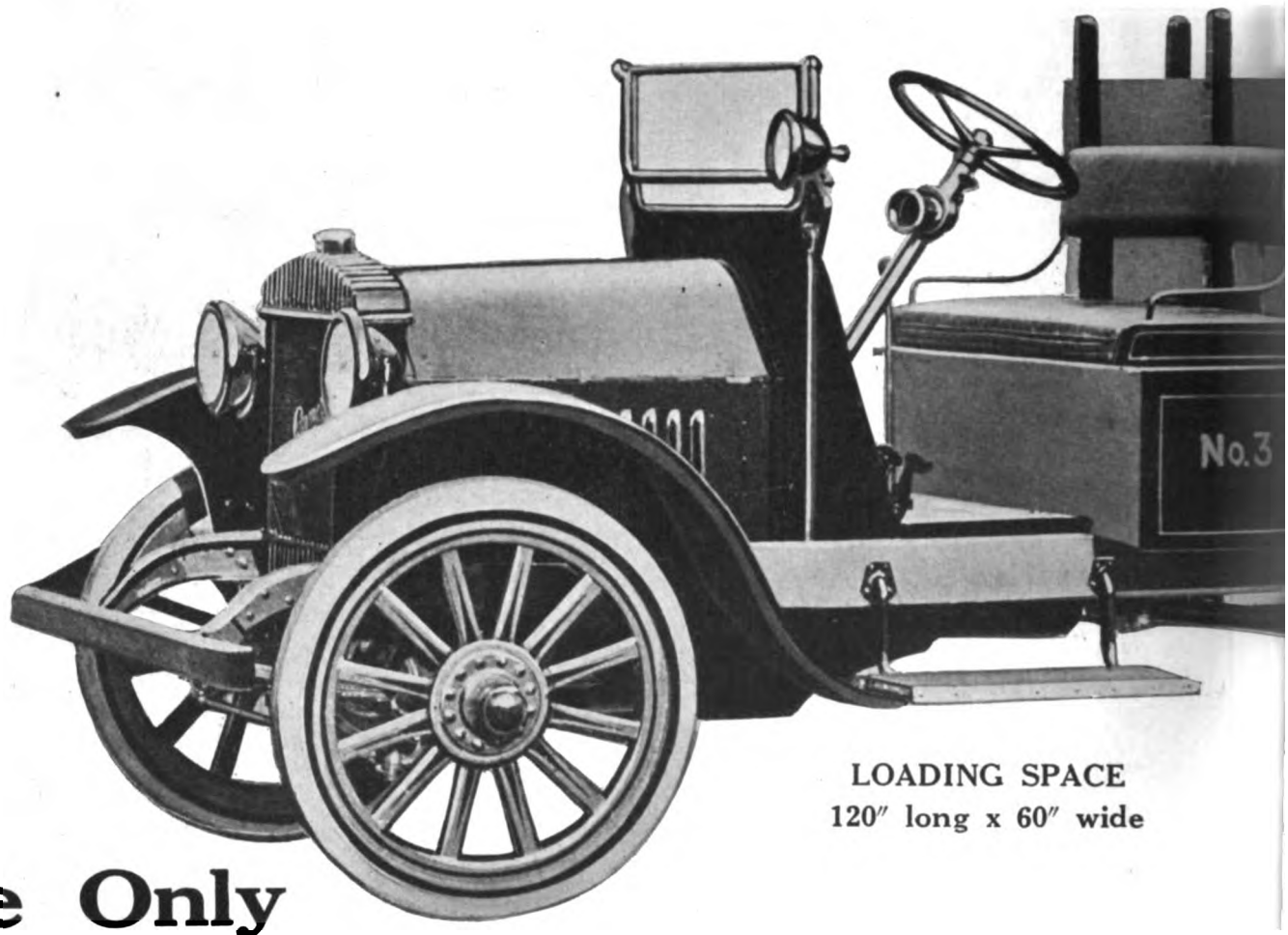
HESS-BRIGHT BALL BEARINGS



THE HESS-BRIGHT MANUFACTURING CO.
PHILADELPHIA

HESS-BRIGHT'S CONRAD PATENTS ARE THOROUGHLY ADJUDICATED

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LOADING SPACE
120″ long x 60″ wide

The Only Truck Completely Equipped Now—Without Extra Cost

Commerce

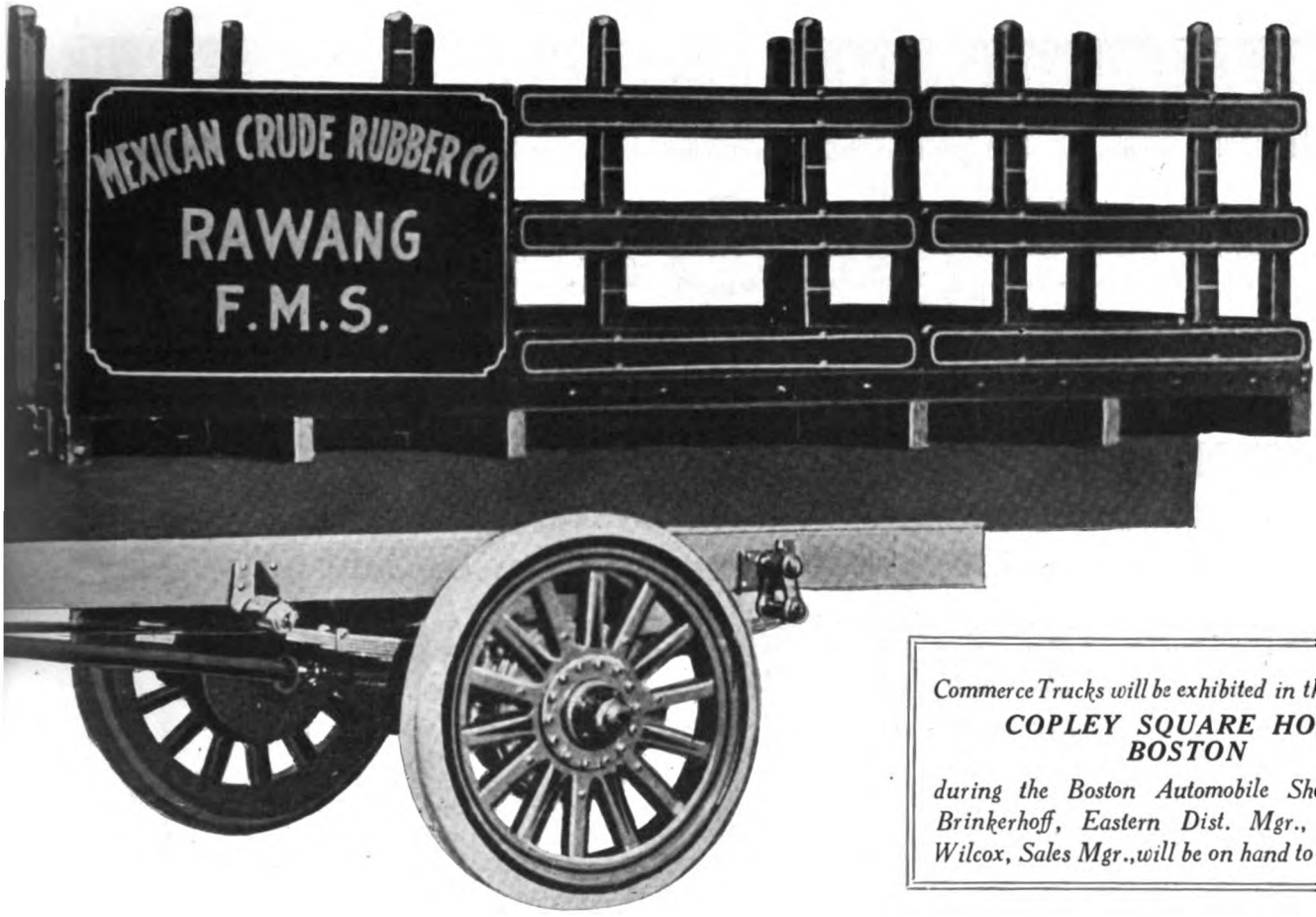
ONE TON

MODEL ES

New Model just added to Commerce Line, New York Type, stake job. Completely equipped.

$1290

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Commerce Trucks will be exhibited in the lobby of the
COPLEY SQUARE HOTEL
BOSTON
during the Boston Automobile Show. W. H. Brinkerhoff, Eastern Dist. Mgr., and George Wilcox, Sales Mgr., will be on hand to welcome you

THE COMMERCE IS COMPLETE, ready to go to work straight from the Dealer's hands.

THE BUYER IS NOT HELD UP while needful equipment is added at extra cost.

EVERYTHING KNOWN IN THE WAY OF useful, time-saving, labor-saving, cost-cutting devices that have proved their efficiency and are really necessary to a properly equipped truck, is included in the Commerce Truck when you buy it!

LEADING DEALERS ALL OVER THE COUNTRY are selling Commerce Trucks with ease and satisfaction. They have no rivals in completeness of make-up.

EQUAL TO THE MOST DISTINGUISHED of its competitors in every other respect, the Commerce Truck is vastly superior in point of up-to-the-minute equipment.

NEXT YEAR—AND THE YEAR AFTER—OTHER TRUCKS will follow suit—many are already preparing to do so—but the Commerce has the big jump on them all.

THE COMMERCE HAS DONE IT ALREADY AND IS NOW—TODAY—prepared to go right to work for its owner with all these necessary details of equipment an integral part of the truck itself—included in the purchase price.

WHY NOT BUY A WHOLE TRUCK—at once!

DEALERS: *Sell your customers a real 1918 Model and get the cream of the trade. We give you a square deal and the shortest, most easily understood contract agreement you ever saw.*

LOOK AT THESE!

Complete Equipment
3 types of bodies
A windshield
Remy Starting and Lighting
A Spotlight
A Bumper (integral with frame)
Large Searchlights (with dimmers)
Stewart Vacuum System
Pierce Automatic Governor

Quality Units
Continental Motor
Torbensen Internal Gear Rear Axle
Cast Tank Radiator with Removable Core
Truck Type Roller Bearing Front Axle
Unit Transmission, Special Truck Type
Detroit Steel Products Company Springs

These, together with special truck frame and fittings such as are usually found in a truck of 2 tons capacity, are the principal units that enter into the construction of the "Model ES" Commerce 1-ton Truck.

¾-Ton Model, $975. Supplied with 3 types of bodies.

Commerce Motor Car Company
DETROIT **MICHIGAN**

W. H. Brinkerhoff, Eastern District Manager, Belmont Avenue, Elmhurst, Long Island, N. Y.

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive $1095

Two-Ton Worm Drive $2200

Three-and-One-Half-Ton Worm Drive $3100

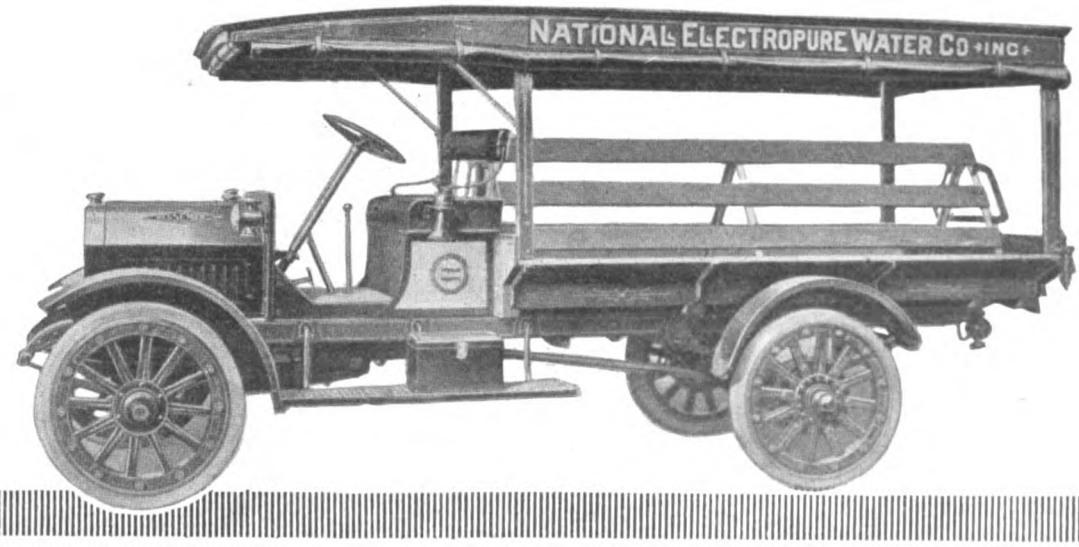
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

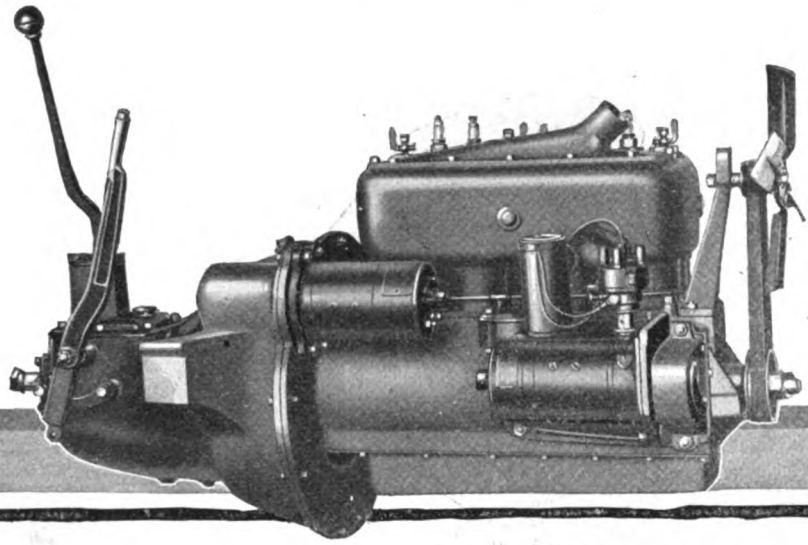
Bessemer Motor Truck Company **Grove City, Pa.**

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State



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Four cylinders, 3¾ x 4¼ in. 22½ H.P. A.L.A.M. rating. Develops 36.9 H.P. at 2800 revolutions per minute.

Polished Perfection

A KEEN appreciation of the fact that no motor is fully sold until it reaches and satisfies the car buying public has led us to devote all our skill, resources and manufacturing energies to the production of one type and one size of motor.

Through concentration and specialization on this model—we have virtually bound ourselves to produce a motor that simply *must* excel. We have no other size or model to offer if this does not satisfy. Therefore, as a logical sequence, our sole business is to produce this motor of such quality, such workmanship, such flexibility and such smoothness of operation, such power and durability, that it does everything expected of it—and more.

"This one thing we do" is the slogan of the G. B. & S. organization, and its practical result is a four-cylinder motor developed to the point of polished perfection.

1917 Refinements include: Shorter intake, permitting placing of carburetor closer to motor, reducing gas friction. New chain adjustment—you can take up all slack quickly while motor is running. Larger chain. Larger flywheel, giving greater starting torque. Larger flywheel housing, providing ample room for placing of an inboard starter—any standard make. G. B. & S. Motors now provide for 2-unit starting and lighting system exclusively, operated through Bendix drive.

For blue prints and other information write

Golden, Belknap & Swartz Co.

Detroit, Mich.

G·B&S motors

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Buying Good Brake Lining Is Like Buying Good Shoes

—for both prove their worth through their ability to resist wear in the grind of steady service. But shoes may wear out without actual danger. Quality in Brake Lining is absolutely vital.



GARCO is built to back your good workmanship. It is a firm foundation on which hundreds of dealers are building a reputation for quality work and quality accessories of all kinds. GARCO is solidly woven. It holds with the grip of a giant till the last shred is entirely gone.

For Safety's sake, recommend GARCO for every brake lining renewal. When your customer leaves the choice of brake lining up to you, use GARCO. Clinch his future business along this line for all time.

GARCO is sold by all jobbers. Write yours today for our fair-deal proposition. The GARCO Line of Asbestos Auto Specialties is complete. Investigate GARCO Transmission Band Lining for Ford Cars.

General Asbestos & Rubber Company

Main Office and Factories: CHARLESTON, S. C.

BRANCHES: 58 Warren Street, New York; 311 Water Street, Pittsburgh, Pa.; 106 West Lake St., Chicago, Ill.

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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Haul It in a Hall

For Safety and Saving

There is nothing fine-drawn or delicate about the HALL TRUCK.

Here is a picture of one carrying four tons of steel. The rated capacity of this particular truck is three and a half tons, but just the same you can hop in, put your foot on the gas and drive this load away with absolute ease and safety.

And you can speed up, turn corners, plough through mud or sand, roll over rough roads—absolute ease and safety just the same!

That is the big point about the Hall—its in-built over-strength—its ability to rise to an occasion, to fill in an emergency, when time, money and business faith are at stake.

Big, burly, strong and speedy above all prospective needs, the Hall is an extraordinary time-saver, a cost-reducer, and the perfect embodiment of dependability.

In addition to its other merits the HALL is equipped with an IMPROVED WOOD HYDRAULIC HOIST, the fastest, most efficient and economical dumping device known, and a great cost cutter.

DEALERS: In addition to other sales helps and backing, we have arranged to finance your customers who desire to purchase on the deferred payment plan. Every HALL dealer is well taken care of and making friends and money fast. Better get in on this prosperity!

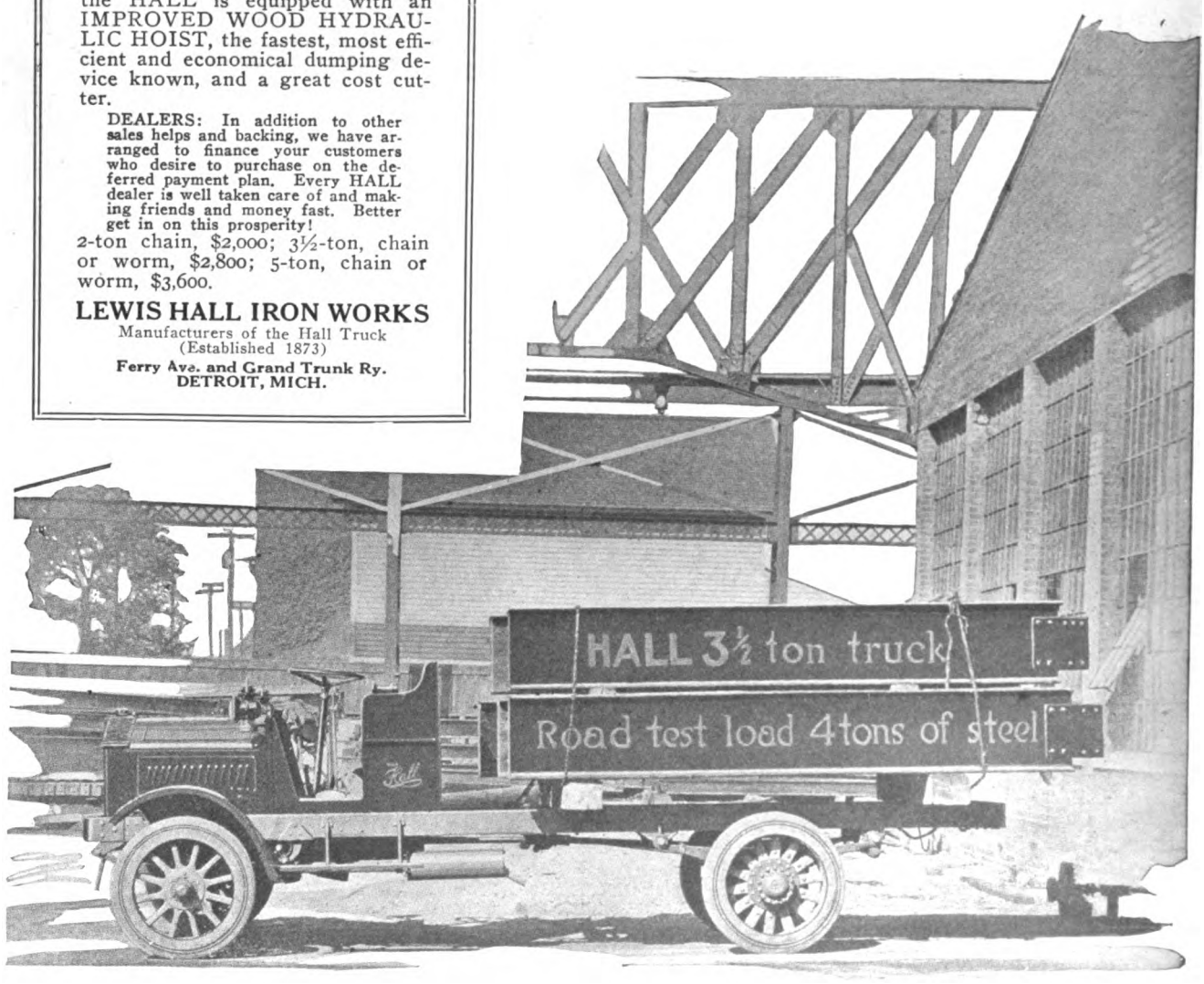
2-ton chain, $2,000; 3½-ton, chain or worm, $2,800; 5-ton, chain or worm, $3,600.

LEWIS HALL IRON WORKS

Manufacturers of the Hall Truck
(Established 1873)

Ferry Ave. and Grand Trunk Ry.
DETROIT, MICH.

THE Hall TRUCK



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Thought 2-ton was 3½-ton AT TERBURY

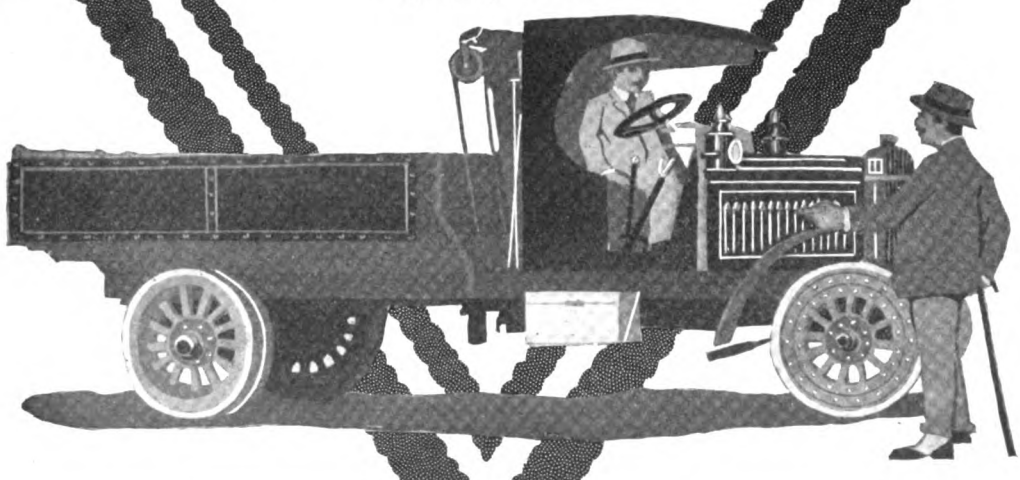
A prominent dealer asked to see a 2-ton Atterbury. The chassis was driven up to his door. He came out and looked, and said: "I didn't ask for a 3½-ton. I want to see a 2-ton."

The fact was, that truck was a 2-ton. Although the dealer knew trucks—all makes of them—he was deceived by the fact that the Atterbury is made larger than necessary throughout.

This makes the Atterbury a profitable truck to buy and a profitable truck to sell.

A few more live dealers can now be added. Write or telegraph today for particulars and get the "Atterbury Truck Book."

Atterbury Motor Car Co.
Buffalo, N. Y.



ATTERBURY

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F W D

An Extreme Example

JUST as an example of the efficiency of the four wheel drive principle as applied in F-W-D Trucks—imagine a truck in the position illustrated above, with the front wheels against the curb. If it were a rear drive truck it would require a great effort of power to push the front wheels up the curb.

Now think what would happen when there is power in the front wheels. They would lift themselves over the obstruction with little effort. This is an extreme case to show what takes place continually on ordinary roads.

In the F-W-D Truck the rear wheels do not push the dead-weight on the front wheels over ruts and obstructions—the front wheels lift themselves and do their share of the pulling. This means saving of power, saving of fuel and saving of money. Demonstrations like this easily convince any business man of the dependability of F-W-D Trucks.

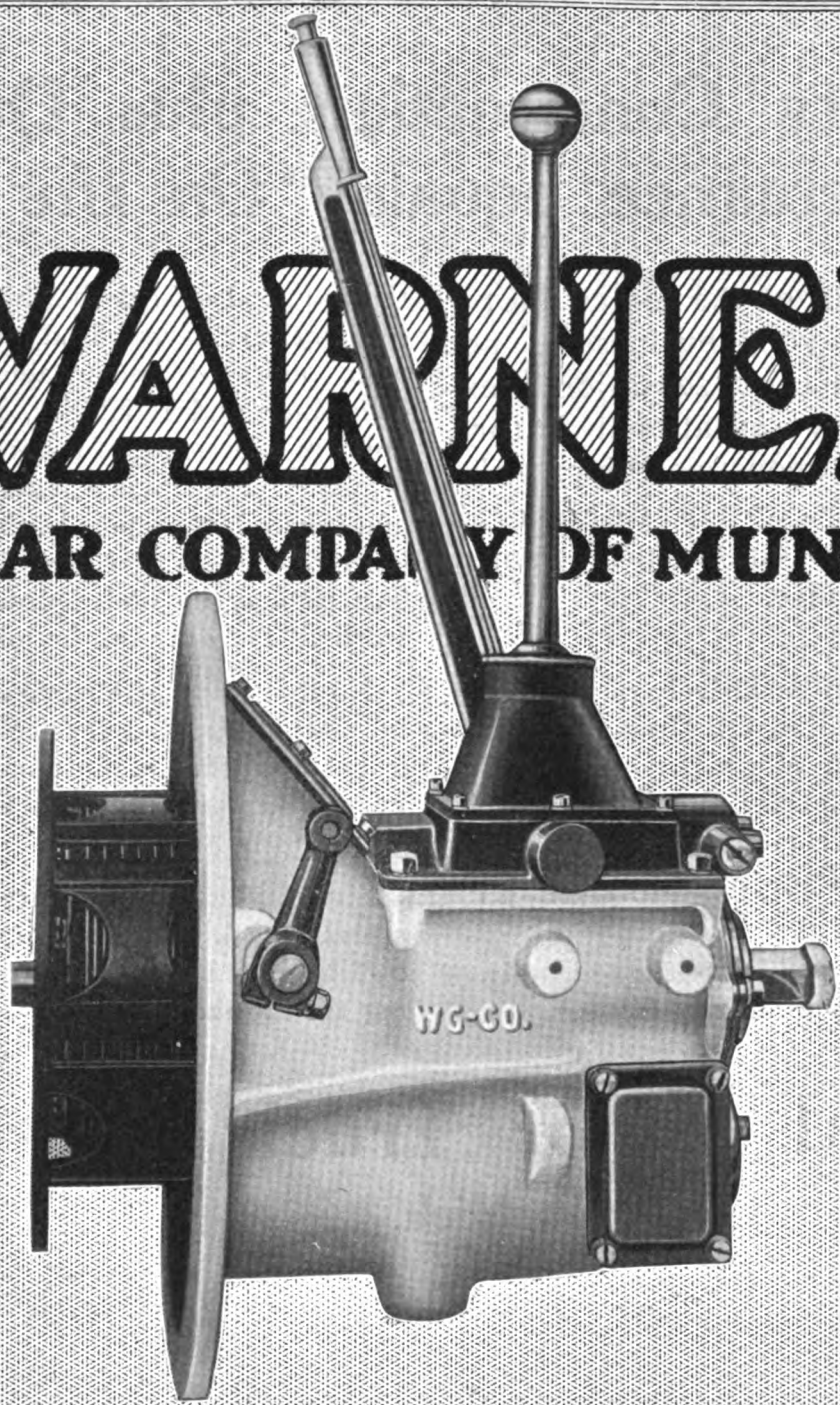
Dealers who desire to build up a permanent business with customers who buy a truck for its investment value will be considered in open territories. To such we'll gladly send details of our agreement, prices, discounts and terms.

Four Wheel Drive Auto Co., Dept. K, Clintonville, Wis.

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WARNER

GEAR COMPANY OF MUNCIE



Warner Truck Transmissions

A Mark of High Quality and Long Service In Any Motor Truck

TRANSMISSIONS · CLUTCHES STEERING GEARS · DIFFERENTIALS

WARNER GEAR COMPANY, Muncie, Indiana

Detroit Office, 967 Woodward Ave.

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Quality Construction plus Quality Performance equals "*On the Job*"

The claim of the Signal Motor Truck for your business is not based upon any sensational exploit or any sensational feature. It is based upon two things only: (a) quality construction all through, (b) quality performance in daily service.

The quality construction is evidenced by the use of exclusively quality units, such as Continental Motors, Timken-David Brown Worm Drive Rear Axles, Ross Steering Gear, Brown-Lipe Transmission, Eisemann Magneto, Detroit Self-Lubricating Springs, Stromberg Carburetor.

Equally important with the quality of the units is the careful engineering and the practical skill with which the various units are harmonized into one complete unit of remarkable strength, endurance and reliability, so that the uniform experience of users everywhere is quality performance in daily service—and the uniform report to those who inquire of users concerning Signal Motor Trucks may be boiled down into five words: "They are on the job."

No matter what business you are in, no matter for what service you require a motor truck, the most important element you can buy in a truck is the ability to be "on the job."

Signal Motor Trucks are built in all sizes, from 1 ton to 5 tons. Write for catalogue and full information concerning the Signal line.

Signal Motor Truck Co.

Detroit, Mich.



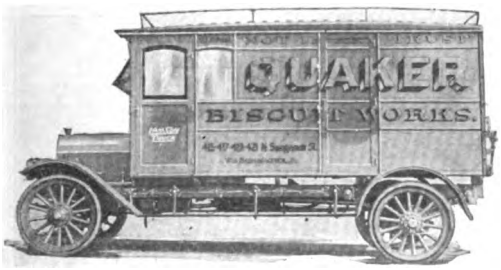
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LAMSON TRUCKS









5 Popular Sizes
1, 1½, 2½, 3½ and 5 Ton

A model for practically every business requirement—at reasonable prices consistent only with the highest grade material, parts and workmanship.

We are actually manufacturing all sizes listed, and are able to make prompt deliveries.

These Specifications Tell the Story

GENERAL SPECIFICATIONS

Uniform in all Sizes

Motor—Wisconsin, 4 cylinder, long stroke
Clutch—Borg & Beck
Transmission—Cotta
Axles—Sheldon
Steering Gear—Ross
Springs—Semi-elliptic
Tires—Optional
Carbureter—Stromberg
Gas Supply—Seamless steel tank with Stewart Vacuum System
Ignition—Dual—Bosch magneto and Atwater Kent Unisparker
Governor—Monarch
Electric Lights—Vesta System

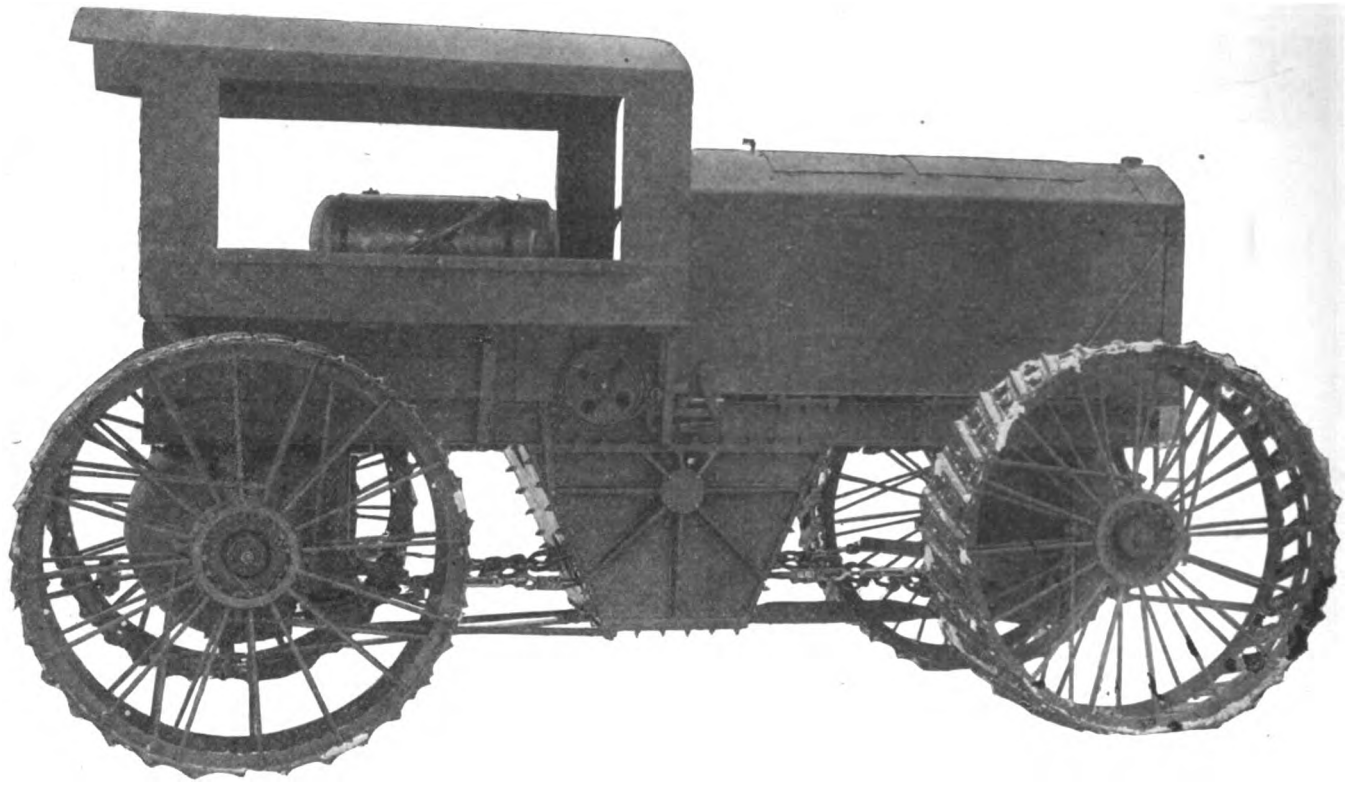
Correspondence Solicited with Live Dealers and Distributors

Lamson Truck & Tractor Co.

4644 W. Madison Street, Chicago

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Lenox "American" Tractor



The "American" doing practical road work

SPECIAL ADVANTAGES

4-wheel drive, 4-wheel steer, light weight, extreme flexibility and unusual amount of horsepower actually delivered at the drawbar.

Splendid territory open for live dealers.

Catalogue and prices on request.

Will exhibit in Good Roads Show, Space Booths 212-213, Boston, Mass., from Feb. 5th to 9th.

Manufactured by

LENOX MOTOR CAR COMPANY

BOSTON, MASS.

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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CO-OPERATION

GRAMM BERNSTEIN

Increased Selling Power

Suppose, Mr. Dealer, you have solicited an important truck prospect, a big order is hanging in the balance—you long for an "80 horse-power" salesman to help close the deal.

If you are a Gramm-Bernstein dealer, you have at your command the highest grade truck salesmen; members of our factory sales force, who are ready personally to assist our Dealers in closing sales.

Write us for a description of how we help Dealers locate prospects; how your prospects are circularized regularly every month from the home office; how our policy of local newspaper advertising permits you to be the best known dealer in your locality; how the G-B Statistical Department supplies comprehensive data, invaluable in aggressive sales work,—and many other unusual features.

Back of the Dealer's efforts—back of the G-B advertising and sales co-operation, is the repute of Gramm-Bernstein—to the average truck buyer pregnant with significance—a name that has behind it sixteen years of the brainwork of the master truck builder, B. A. Gramm.

Gramm-Bernstein gives you **the advantage of a full line,** (1 to 6 tons). Our agents can meet **any** requirements in a truck—perfectly satisfy every prospect.

And you enjoy the benefit of the Gramm-Bernstein sales policy—**the most profitable sales policy** ever put up to any ambitious man or firm.

Inquiries are being received rapidly and territory is being assigned rapidly. Write at once or telegraph. Action NOW will cost you nothing—it may mean big profits for you in a Gramm-Bernstein Agency.

Gramm-Bernstein Motor Truck Company
Lima, Ohio, U. S. A.

The Gramm-Bernstein Motor Truck Company.
13 Gramm Blvd.
Lima, Ohio, U. S. A.

Please send me complete explanation of your new sales policy on Gramm-Bernstein Trucks, including reasons why it will pay me to handle the line; the advertising you will do for me in my local papers; the Dealer Sales Service, etc.

Name .....

.....

Street and Number.....

City..... State.....

I { am / am not } representing a truck at the present time.

If you are representing a truck at present, please give the name of it here.

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Actual Performance

has demonstrated the high quality of Fuller Transmissions.

Given the finest steel, skillful workmen, modern devices for obtaining the highest degree of accuracy—and a high quality product may be looked for.

But actual performance is the only real proof, the only incontestable evidence of superiority.

FULLER TRANSMISSIONS

For silent smoothness of action, full delivery of power, ease of operation, durability and economy of upkeep, Fuller Transmissions commend themselves by their daily performance on trucks of the highest class throughout the country.



FULLER & SONS MFG. COMPANY

KALAMAZOO MICHIGAN

EASTERN REPRESENTATIVES

Earle & Boggs
1790 Broadway, N. Y. City

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KisselKar Truck in use by Armolds Kissel Truck Transfer Co., Roswell, N. Mex.

KISSELKAR TRUCKS

The final choice of purchasing experts in over 200 different lines of business.

The matchless Kissel-built motor and perfected worm drive rear axle are guaranteed with every KisselKar Truck.

Six sizes from the 1500 lb. Delivery up. Chassis prices $950 to $3350.

KisselKar Truck branches, display rooms and service stations in all principal cities and towns.

AWAY out in Roswell, New Mexico, is no place to experiment with unproven trucks.

That is why the Armold Transfer Company, after rigid investigation, decided on KisselKar Truck Equipment.

Their business is transporting light and heavy loads on schedule time in long and short hauls. They find that KisselKar Trucks are gluttons for work and are always on the job, while the Kissel-built engine insures a continuous and uninterrupted delivery schedule.

There is a KisselKar Truck built in the size you require. Send for data on KisselKar Truck performance in your line of business.

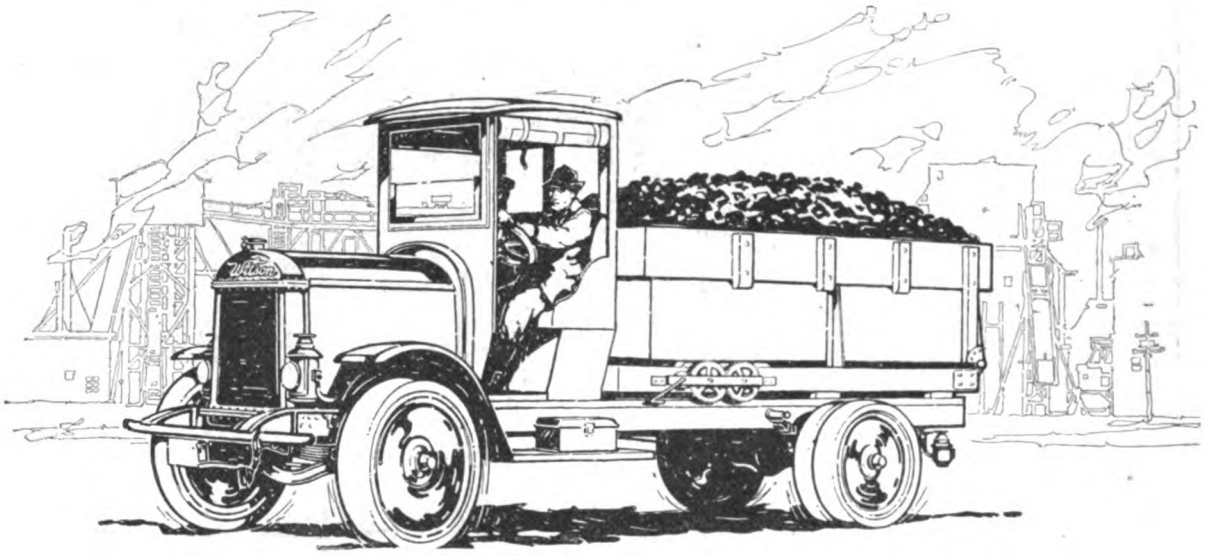
Dealers—A KisselKar Truck Agency in unoccupied territory is an investment—a dividend producer of the first magnitude. Investigate.

KISSEL MOTOR CAR COMPANY

Hartford, Wisconsin

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Wilson Motor Trucks



The New One-Ton Wilson

Smaller—but otherwise a duplicate of the standard two-ton Wilson Truck.

Same careful design—same engineering and constructive ability back of it—simply a lighter edition of the Wilson you have come to know as the Standard of motor truck quality.

Wilson now offers you a line that is practically complete—ranging as it does from a carrying capacity of one ton to a haulage capacity of five to six tons.

It is the livest dealer proposition in the motor truck field today.

Better get your application for territory in at once.

J. C. Wilson Company, Detroit, Mich.

Good territory still open for responsible dealers. Sign and mail coupon today.

J. C. WILSON CO., DETROIT *MAIL THIS*

Please send me your Proposition to dealers.

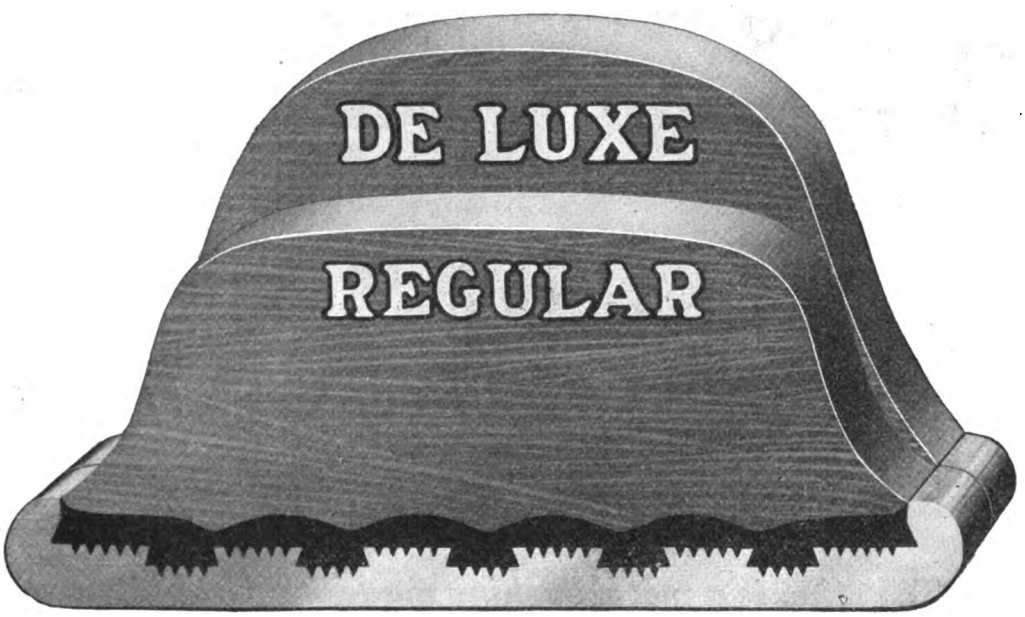
*Name*_____

Address _____

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"Velvet Mileage"

FROM



GOODRICH DE LUXE TRUCK TIRES

To avoid excessive vibration, truck users sometimes discard ordinary tires after they have worn down about one inch.

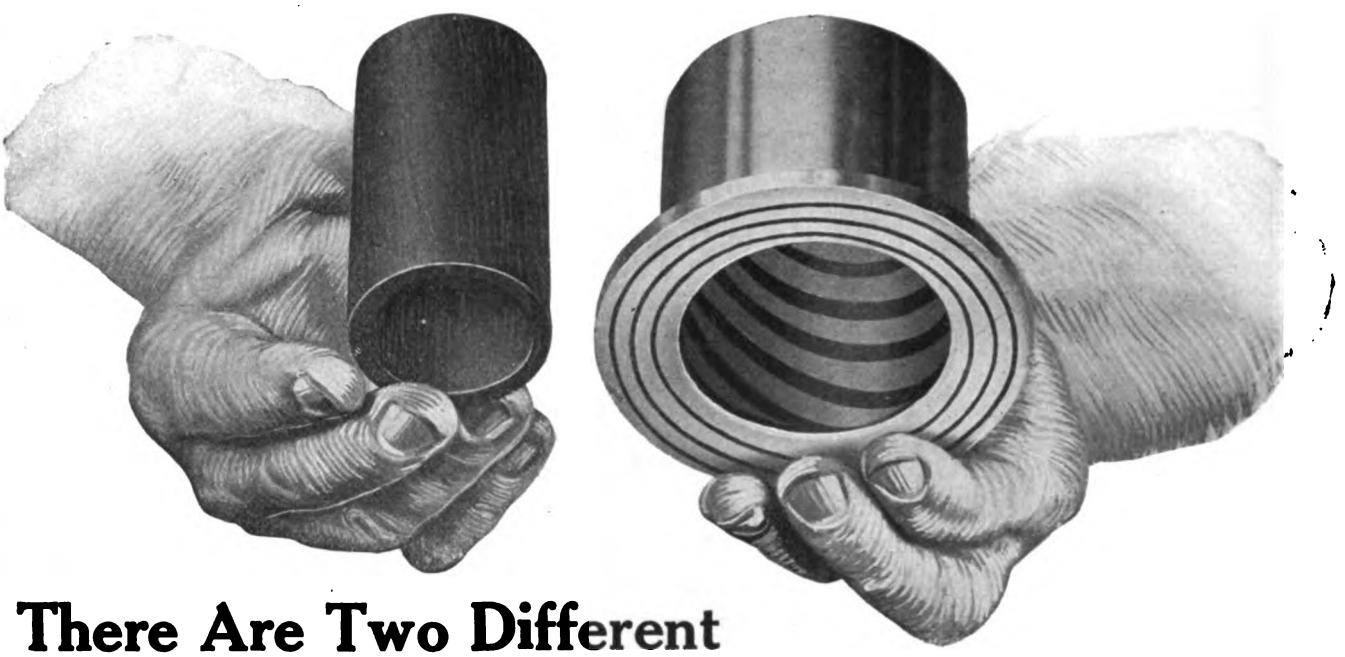
Goodrich **De Luxe** tires contain nearly twice as much rubber which must be worn down before they reach that point.

That's why users say they deliver "Velvet Mileage."

THE B. F. GOODRICH CO., Akron, Ohio

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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There Are Two Different Kinds of Genuine Graphited Oil-less Bushings



One is a hard wood bushing impregnated with lubricant and is known as "NIGRUM"

The other is a metal bushing made of "Graphite and Bronze" and is known as "BOUND BROOK"



Trade Mark
NIGRUM Bushings are made of hard wood
Reg. U. S. Pat. Off.
carefully seasoned and then impregnated by means of a patented and exclusive process with our own special lubricating compound.

They are lighter in weight than metal, yet possess certain distinctive advantages not to be found in any other form of bushing.

They require no oiling to give efficient service. Once installed you can forget them—they take care of themselves—need no oil—no attention—and *absorb* dust and grit, thus protecting the shaft and letting it run more smoothly, without the slightest dimunition of their own efficiency.

Many truck manufacturers are using these bushings with pronounced success in truck parts which are inaccessible and therefore difficult or impossible to lubricate properly.

Those manufacturers who use NIGRUM Bushings are saving truck owners time and money because of the long-lasting qualities of these bushings which greatly reduce the frequency with which trucks must be overhauled, as well as much of the possible trouble and annoyance that would result from the use of ordinary bushings that require constant attention to give efficient service.

Trade Mark
BOUND BROOK Bushings are made of a high-
Reg. U. S. Pat. Off.
grade bronze, and are so designed and constructed as to retain lubricating graphite.

"Oil-less and Less-Oil" is a good descriptive term for these bushings.

They have all the advantages of ordinary bronze bushings and have the added advantage of not requiring oil to give efficient service, although oil does not harm them. In other words the efficiency of these bushings is not dependent upon the constant attention of the owner.

They are used by a great many far-sighted truck manufacturers in places where failure to keep the bushings properly lubricated would result in their wearing out fast. In this way these manufacturers are insuring the long life of their trucks, even in spite of neglect or abuse.

Both "NIGRUM" and "BOUND BROOK" bushings are made only "to order." Manufacturers are invited to take up their bushing problems with us. We have specialized in the production of Oil-less bushings for more than a third of a century.

All Genuine Graphited Oil-less Bearings have always been made at Bound Brook, U. S. A.

BOUND BROOK OIL-LESS BEARING COMPANY

Specialists in the Manufacture of Oil-less Bearings for More Than a Third of a Century

BOUND BROOK **NEW JERSEY**

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THE WINTHER

affords the first and only complete line of American-made heavy duty internal gear motor trucks—seasoned pioneers—built by master builders—ready for faultless service in whatever degree.

Produced in the following capacities, they blanket their field—capable, durable, dependable.

Model 37—1½-ton .....Maximum, 3,000 pounds
Model 57—2½-ton .....Maximum, 5,000 pounds
Model 87—3½-4-ton .....Maximum, 8,000 pounds
Model 127—5-6-ton .....Maximum, 12,000 pounds

FEATURES

Internal Gear, Locking Differentials, Drop Forged Axles, Timken Bearings, Four-Bearing Crankshaft, Force Feed Oiling, Optional Wheelbases, Variable Frame Lengths, 3½% Nickel Gears, Constant Mesh Transmission, Vanadium Steel Springs, etc.

We have a liberal distributors' offer for a few well-organized and well-financed dealers.

The Winther Motor Truck Company

Kenosha, Wisconsin

775320

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Maxwell

FOR two years our dealers have urged us to build a commercial car. They have told us of the insistent appeal for a light motor truck—a truck that, by right of greater value, would dominate its field.

To satisfy this demand—to build a truck that would favorably compare with our passenger car was no light task. So we started months ago to investigate; to design; test and experiment; to buy the raw materials and to arrange our factories for efficient, economical production.

Maxwell has always followed the policy of building first a product of exceeding merit that would give *Continuous Owner Satisfaction* and then building it in such great numbers that the price could be reduced.

The same policy governs the manufacture of the Maxwell One-Ton Truck.

Famous Maxwell Engine Used

We shall use the same redoubtable Maxwell Motor—the motor that drove the World's Endurance Champion Maxwell Car for 22,022 miles without once stopping—the motor that develops 33 4-5 H. P. by actual dynamometer test—the motor that has carried the Maxwell car to victory in hill climbs, in reliability contests, through mud, sand, and over the worst roads imaginable.

The same Maxwell motor that has done all this and much more, and giving, meanwhile, 20 or more miles per gallon of gasoline!

A Real Truck Versus a Makeshift

Remember, however, that the Maxwell One-Ton Truck is not a revamped or reconstructed pleasure car.

The Motor is the *only* point of similarity.

It is easy and cheap to disguise a touring car with a delivery body. But we are not building our reputation on imitations or entrusting our future welfare to expedients.

The Maxwell One-Ton Truck is a real truck—a commercial vehicle through and through.

Worm Drive

The Timken-David Brown Worm and Gear is used for final drive in the Maxwell One-Ton Truck.

The worm drive presents none of the objections and difficulties usually encountered with other forms of final drive. Worm drive is everywhere recognized as superior, especially for lighter weight trucks.

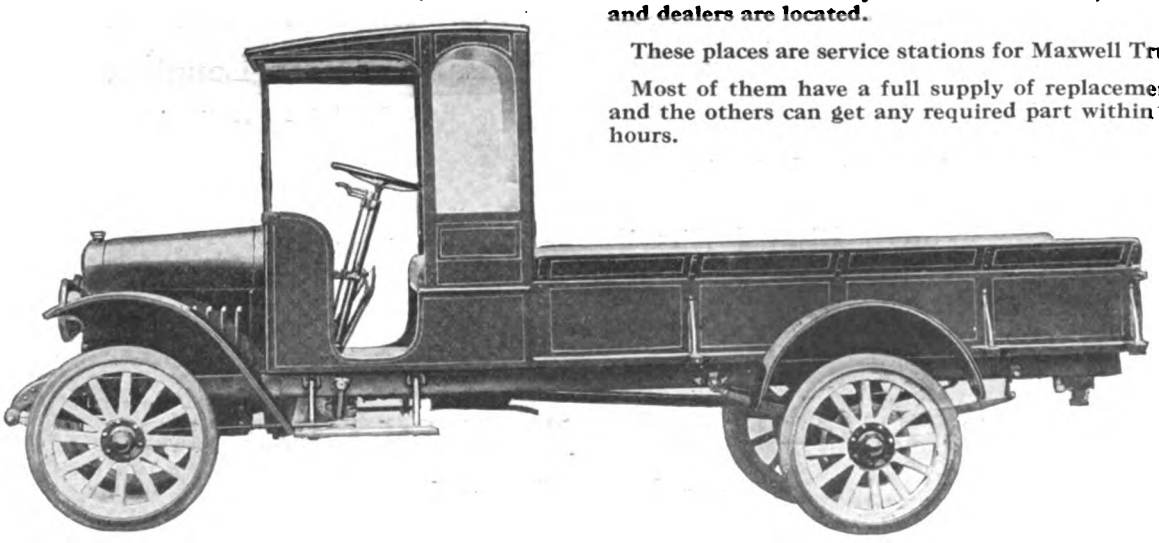
Other features of the Maxwell Truck, together with detailed specifications, are covered in our new truck catalog, just off the press. Copies will be promptly forwarded on request.

Maxwell Service

All over the country Maxwell branches, distributors and dealers are located.

These places are service stations for Maxwell Trucks.

Most of them have a full supply of replacement parts and the others can get any required part within 12 to 24 hours.



Chassis and Box Body with Cab and Windshield . **$850** F. O. B. FACTORY

Write for Truck Catalog and Full Information

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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One ton Truck

Such service is impossible for the exclusive truck builder. He cannot get and could not maintain such a nation-wide organization.

It is only our tremendous passenger car business that makes it possible in our case.

Quantity Production

Not only are we one of the world's largest producers of motor cars; we plan also to be the largest producer of trucks.

Through this immense volume of business we can attain a manufacturing efficiency heretofore unknown. We can furnish a better product for less money.

Commercial cars are usually built in small quantities—a few hundreds or two or three thousands per year—hence the price must remain high.

Until truck builders meet the competition of large production, they will have to charge high prices for their product.

CHASSIS

$795

F. O. B. FACTORY

The Maxwell alone offers a real truck at a quantity production price.

This price of $795 is truly remarkable.

Go over the whole list of commercial cars made in this country. Compare them point for point with the Maxwell.

Consider the illustrious record of the Maxwell Cars, and then bear in mind that the Maxwell Truck has behind it all the experience gained through years of motor car manufacturing—that the Maxwell Truck is the same dominant value in its field as the Maxwell Car is in its field—that the Maxwell Truck, like all other Maxwell products, is one that reflects the character, ideals and business integrity of the Maxwell Motor Co.

The Maxwell One-Ton Truck opens a field of unlimited possibilities to dealers in every city and town. The combination of Maxwell Cars and Maxwell Trucks is an unbeatable selling proposition.

Specifications

Standard Body Prices

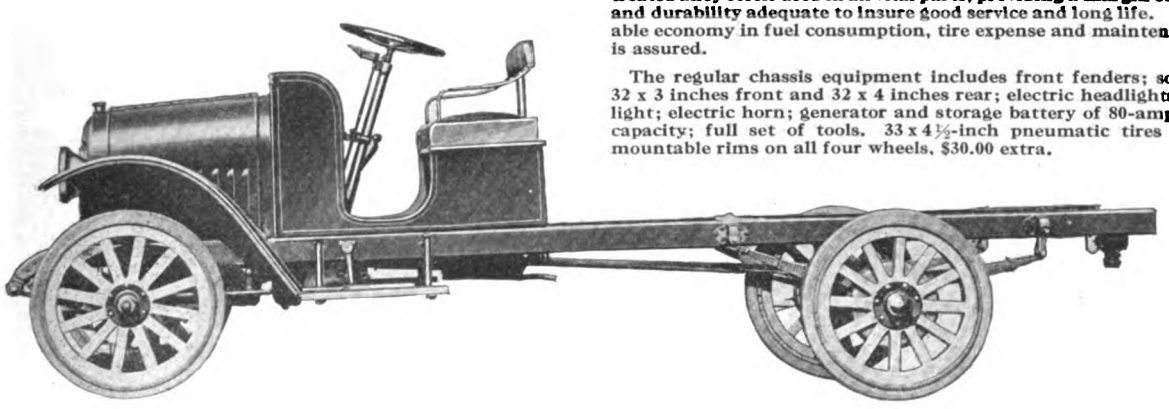
Box Body with Cab and Windshield	$ 55.00
Covered Express Body with integral cab and side curtains	95.00
Panel Body with integral cab	105.00

All prices F. O. B. Factory.

Brief Description

Four-cylinder engine, cast in block, powerful and economical; three-speed transmission; gears made of heat-treated alloy steel. Worm drive, using Timken-David Brown worm and gear embodied in rear axle. Axles of heavy construction with Timken roller bearings throughout. Frame of pressed steel with heavy cross members. Extra long springs made of special spring steel. Sturdy wood wheels with steel rims. Two sets of brakes acting on rear wheels. Heat-treated alloy steels used in all vital parts, providing a margin of strength and durability adequate to insure good service and long life. Remarkable economy in fuel consumption, tire expense and maintenance cost is assured.

The regular chassis equipment includes front fenders; solid tires, 32 x 3 inches front and 32 x 4 inches rear; electric headlights and tail light; electric horn; generator and storage battery of 80-ampere-hour capacity; full set of tools. 33 x 4½-inch pneumatic tires with demountable rims on all four wheels, $30.00 extra.



Price of Chassis with regular equipment as illustrated
$795 F. O. B. Factory

Maxwell Motor Company, Inc. Detroit, Mich.

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Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

Minimum of Vibration

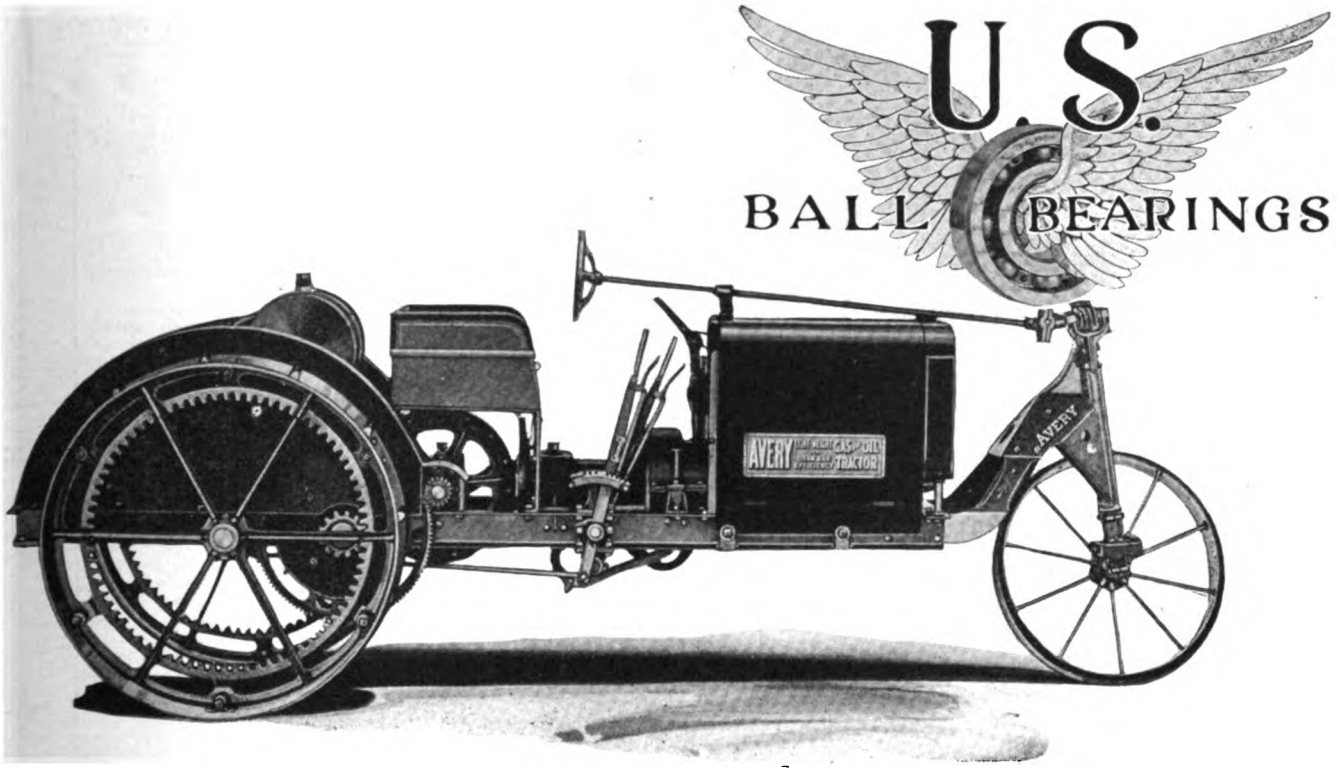
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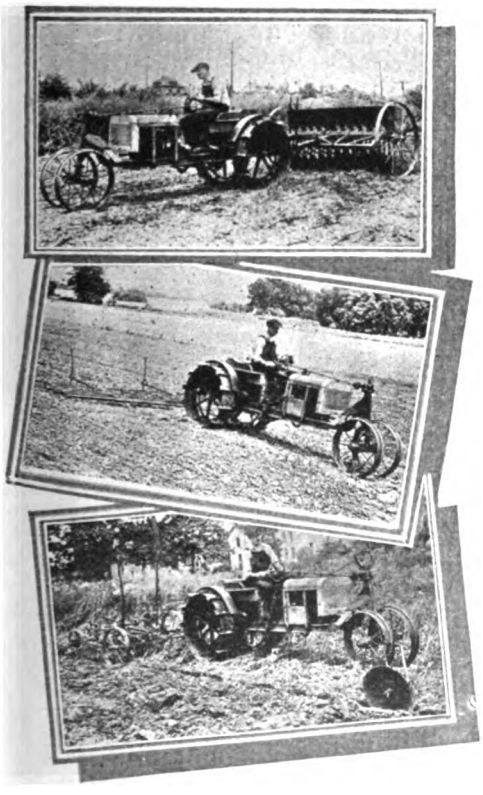
The Mather Spring Company

Toledo, Ohio

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U.S.
BALL BEARINGS





NO MATTER WHAT KIND OF WORK IT DOES—

Ball Bearings have received an extraordinary tribute in being called upon to withstand the unusual and extremely severe strains to which farm tractors are subjected.

U. S. Ball Bearings, especially, are being chosen to undergo this gruelling test, being exceptionally well fitted to meet just such unusual demands.

They are **balanced** bearings, containing no multiplicity of point contacts (adding to friction) nor any extraordinary number of balls (beyond raceway capacity). Raceways and balls are of even capacity, giving a balanced strength equal to any radial or thrust loads they are called upon to sustain.

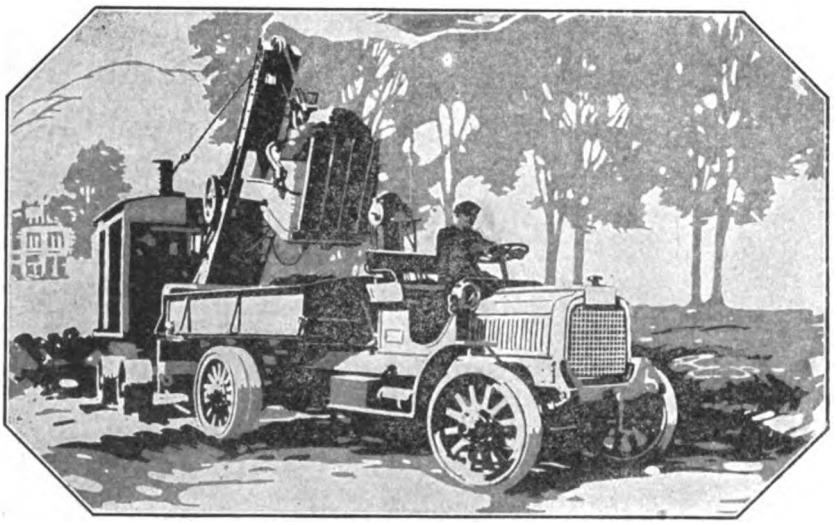
The reason for the superior attributes of U. S. Ball Bearings is found in the **demonstrated correctness of our designs,** as well as in the extreme carefulness and exactitude with which those designs are carried out in the finished product.

U. S. Ball Bearing Manufacturing Co.

(Conrad Patent Licensee)

Palmer Street and Kolmar Avenue, Chicago

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There is one feature of U. S. truck construction—used in no other truck produced anywhere—which alone lifts the U. S. far above ordinary trucks.

It is the *full floating power plant*. This provides the power and transmission system with a flexibility never attained before. It assures perfect alignment. Bearings and moving parts are never submitted to undue pressure by twisting of the frame.

Power and fuel are saved, friction eliminated, and years are added to the life of the truck.

Here is one of the important reasons why more than 50 per cent of the buyers of U. S. trucks in the last eight years have later bought other U. S. trucks.

They are made in 2½, 3½ and 5 ton models, worm drive and 2½ and 3½ ton chain drive.

Several U. S. truck dealers, some in unpromising territory, have been selling trucks at the rate of 200 to 300 per year, each on a strictly quality basis. Write for all the facts.

The United States Motor Truck Co.
CINCINNATI, OHIO

U S
MOTOR FLOATING POWER PLANT TRUCKS

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The COMMERCIAL VEHICLE
Read by Business Men

Published on the first and 15th of every month
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BALL BEARINGS
(PATENTED)

As truck manufacturer or dealer, what you really sell is service, embodied in more or less degree in your truck. As truck owner, what you have really paid for in the truck you bought is service, in more or less degree. And that service is largely determined by the service quality of the magneto, the lighting generator, the starting motor.

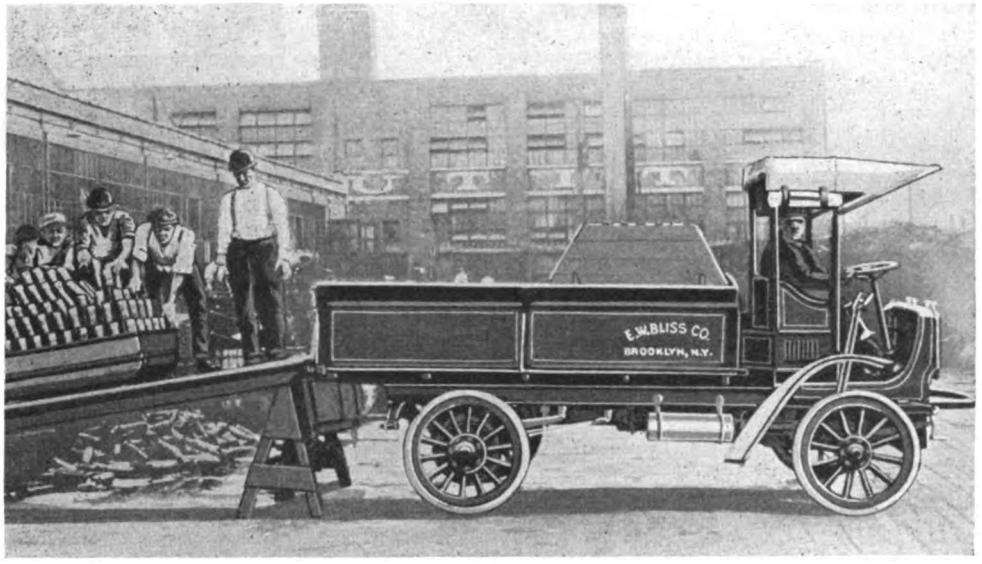
The magnetos known far and wide for their service-giving capacity—the lighting generators everywhere recognized for dependability of service—all are fitted with "NORMA" Bearings. Why? Because of the superlative capacity of "NORMA" Bearings for unfailing service at high speeds.

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Ball, Roller, Thrust, Combination Bearings

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E. W. Bliss Company Are Using Autocars

E. W. Bliss Company of Brooklyn have been using a fleet of six Autocars for two years—two with box bodies, two with rack bodies and two with dump bodies. The cars are used almost entirely for short hauls, the average trip being seven-eighths of a mile. They carry material around the plant from operation to operation. When necessary they go into the buildings—their short wheelbase fits them for work in close quarters. Some of these Autocars have been running 24 hours a day ever since they were put in service.

Write for illustrated catalog and list of more than 4000 concerns using Autocars in every line of business

Chassis $1650

THE AUTOCAR COMPANY

ARDMORE, PA.

Established 1897 **MOTOR DELIVERY CAR SPECIALISTS**

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI February 15, 1917 No. 2

Cleanliness Chief Asset of Trucks in Butter Delivery

Fleet of Twenty 1-Ton Electrics and Three Gas Trucks Distribute Dairy Product Within 15-Mile Radius of Gotham Plant

CLEANLINESS, cheapness and advertising value were the three most important advantages accruing to motor trucks and not to horse wagons which led the Blue Valley Butter Co. to purchase an entirely horseless delivery equipment when that concern opened its New York City branch for the distribution of dairy products, principally butter, to retail stores in the Metropolitan area.

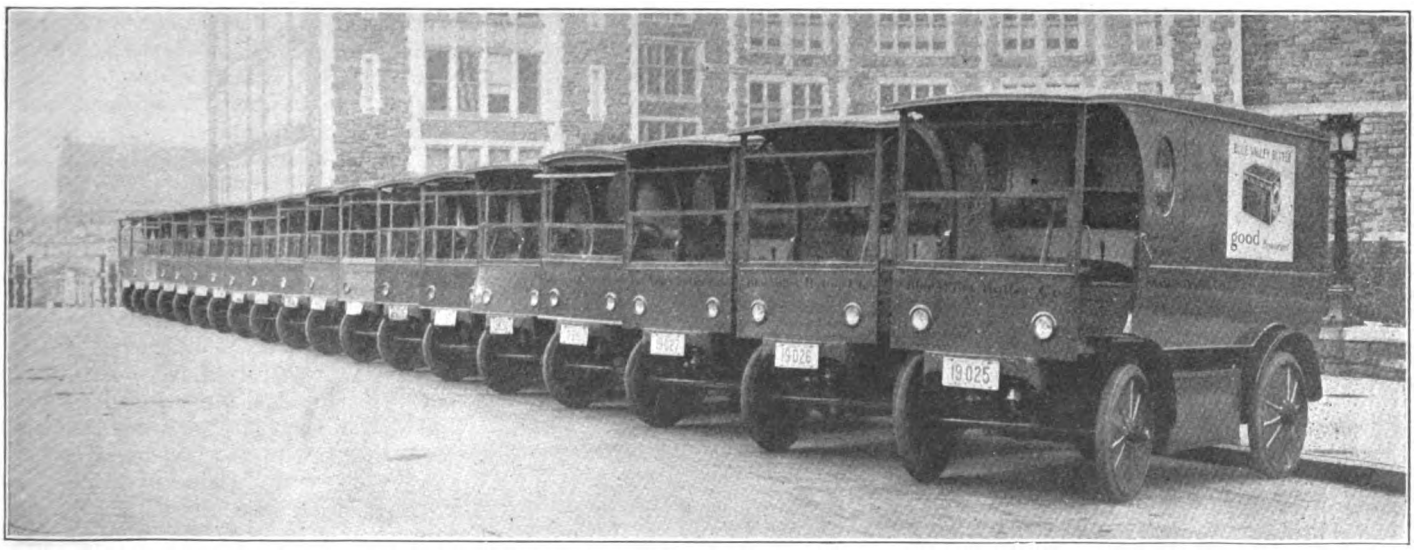
Cleanliness is one of the prime requisites in the handling of dairy products of all kinds, and especially butter, which every one knows seems to have an indefatigable capacity for absorbing the odor from other goods carried in close proximity to it. Every housewife knows better than to place an uncovered crock of butter in the family ice box along with fish, green onions and lemons, if she expects to serve untainted butter on her table.

Butter Must Not Be Tainted

Similarly, horses always have more or less of an odor peculiar to themselves, and the filth incident to their use is ofttimes sufficient to taint such a delicate product as butter with its great affinity for odors.

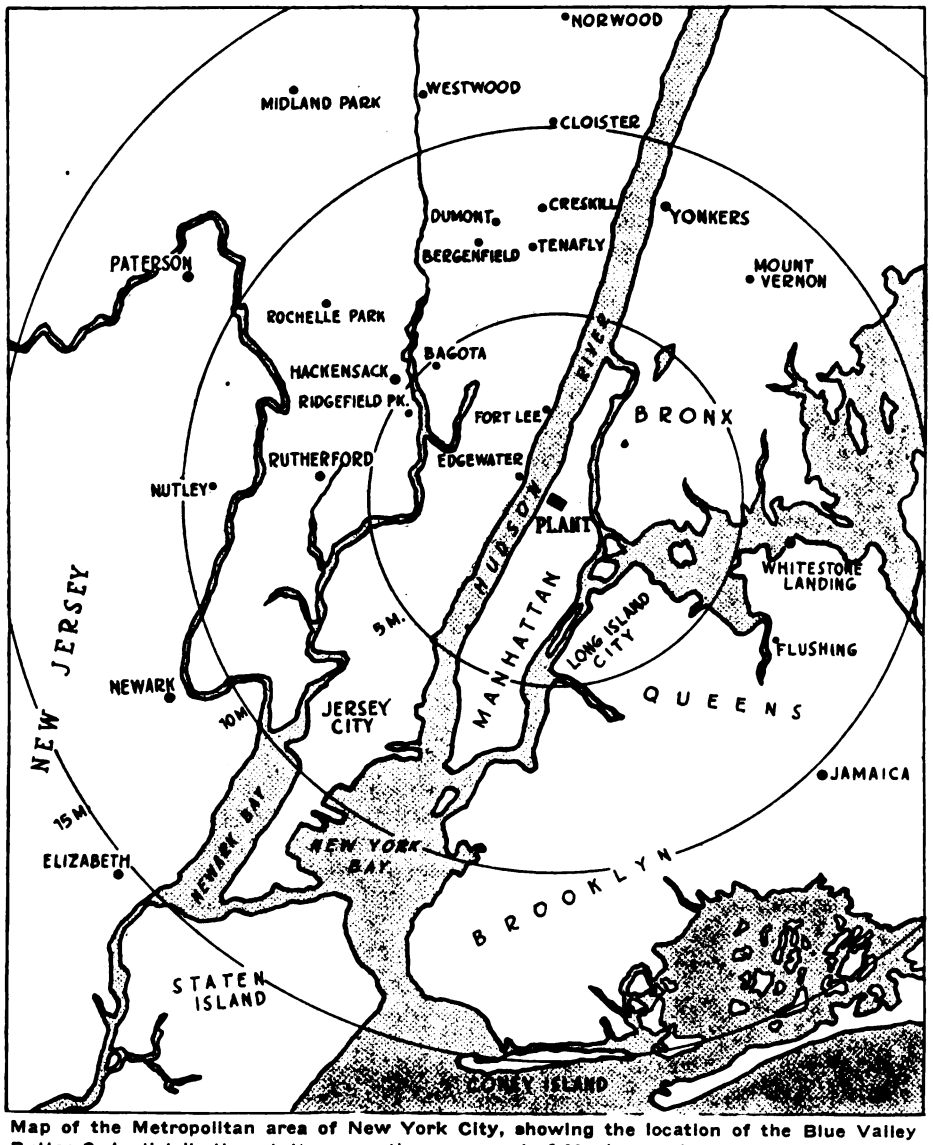
Realizing the public's demand for spotlessly clean and pure food products, and basing its selling arguments on the cleanliness and purity of its print butter, made from Pasteurized cream churned fresh every day, the Blue Valley company could not with consistency risk the final condition of its product as delivered to the retail store by the use of anything except the cleanest type of vehicular equipment. Principally for this reason, the concern purchased nothing but motor trucks.

Hand in hand with the very important consideration of being able to deliver its product uncontaminated to the retail stores went the necessity of delivering it at all. While it was essential that the product be without question as to purity, the means of delivery employed must also



The fleet of twenty 1-ton Walker electrics used by the Blue Valley Butter Co., New York City, to distribute dairy products, principally butter, to retail stores within a radius of 15 miles from the company's station on Manhattan Island as shown in the map on the following page. These electrics average between 40 and 50 miles daily and make between fifty and 115 stops per day. They are driven by salesmen who are started at $18 per week, but whose weekly commission earnings above that amount are only restricted by the volume of business they are able to procure

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Map of the Metropolitan area of New York City, showing the location of the Blue Valley Butter Co.'s distributing station near the upper end of Manhattan Island and the points to which the concern's fleet of twenty 1-ton electrics, two Fords and one 1½-ton Kelly-Springfield truck deliver. The gasoline vehicles are employed principally on the longer runs in the New Jersey territory when the roads there are in poor condition due to either rain or snow

be such that the entire selling territory be covered as often as found necessary, and that the cost of this delivery be not excessive, so as to make the final price to the consumer exorbitant.

Deliveries Made Within 15 Miles

With its possible territory extending clear from the Battery or lower end of Manhattan Island on the South, to Coney Island and Whitestone Landing on the east, to Yonkers on the north, and Hackensack and Paterson, N. J., on the west, all within a 15-mile radius drawn about the company's station as the center, it was necessary that the delivery equipment be able to cover between 40 and 50 miles a day, day after day.

The business conditions thus imposed of course made it impossible to utilize horses except for the short hauls near the plant, and rather than introduce a mixed equipment of both trucks and horses, one sanitary and the other unsanitary, it decided to purchase trucks only so that each of its customers would be assured of the same degree of delivery cleanliness.

The fact that butter is a very perishable product on a hot summer day also had to be considered in the determination of the delivery equipment selected. The speed of the vehicles had to be sufficient to enable the load to be delivered before the heat had been able to penetrate the wood cases and the paper cartons in which the prints are wrapped. Here again the motor vehicle had a most decided advantage as compared with the horse wagon with the necessity of one or more rest periods for the horses, especially when traveling over the hot city pavements under a broiling sun.

Going upon the name of the Blue Valley Butter Company as a basis and realizing the great selling advantages of linking up in some way its advertising with the color of the carton in which its product is sold, the concern long ago adopted a blue and gold container for its print butter. All advertisements of Blue Valley butter are done in blue and gold. Under these conditions it was but natural that the company adhere to its previous practice and paint its delivery vehicles in blue and gold. These two colors make a striking combination, and one which at once proclaims the truck as a member of the Blue Valley fleet.

Experience Similar to Loose-Wiles

The experience of the Blue Valley company in these three respects of cleanliness, cheapness and advertising value is much the same as that of the Loose-Wiles Biscuit Co., maker of Sunshine biscuits, and whose trucks are painted a vivid sunshine color in keeping with the name of its product and its sunshine bakeries located in Long Island City, N. Y. The Loose-Wiles truck equipment, the reasons for its existence and the advantages derived therefrom, were described in the May 15, 1915, issue of THE COMMERCIAL VEHICLE, published less than two months previous to the date at which the Blue Valley company opened its New York City branch.

Why Electrics Were Purchased

The question between motor trucks and horses once settled, it then became the problem of the company to determine what type of vehicle to purchase. The advantages of both the gasoline and electric types were considered, and it was finally decided to purchase electrics exclusively. The most important of the advantages of the electric which aided in its selection included the absence of odors incident to its operation, the great number of stops and starts required per trip; its lower cost of maintenance due to its slower speed, and the fact that the current was shut off during the many stops, averaging between fifty and one hundred fifteen per day, and to the ease in driving.

Mufflers Should Be Farther Aft

Odors from gasoline trucks which might pollute such a delicate product as butter consist principally of the exhaust gases emitted from the muffler. In many of our standard gasoline chassis, the muffler is located entirely in front of the body, instead of nearer the rear, where the gases would pass off behind without an opportunity of sifting up through the body and into the product carried. While it would be a simple thing to move the exhaust muffler a few feet farther to the rear of the chassis, it

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has not been done in many of the gasoline trucks on the market simply because it is one of those small details to which our engineers seem to have given little if any attention.

Drivers' Hands Must Be Clean

It is also taken for granted that a driver of an electric truck gets his hands covered with grease and oil less often than one who drives a gasoline commercial vehicle, due principally to the absence of the gasoline motor and carbureter and the general tendency for gasoline truck drivers to swab off their engines, adjust their carbureters, etc. This elimination of the drivers' dirty hands was also considered, for it must be remembered that the drivers of the Blue Valley fleet are really more salesmen than drivers. They get the orders and actually deliver the goods from the trucks to the counters of the retail stores. It would have availed the company nothing after its clean manufacture of the product and its clean delivery to the retailer's store, if it was made greasy and oily through the medium of the driver's soiled hands in the short trip from the tailboard of the truck to the customer's counter.

The large number of stops and starts per trip also worked in favor of the electric as compared with the gasoline car, because of the fact that the current is shut off while the electric is making its stops. On the other hand, drivers of gasoline trucks not equipped with self-starters are prone to let their engines run during stops, especially in cold weather, to avoid considerable physical exertion in cranking them in attempts to start.

Has 150 Trucks in All

All of these questions were really settled far in advance of the time when the Blue Valley company opened its New York City branch, for it had previously operated electric trucks in Chicago. At the present time it maintains over 150 trucks in its various branches throughout the country. In addition to the branch in New York City, which requires a fleet of twenty-three trucks for its delivery needs, the company also maintains creameries and distributing stations in Chicago, Indianapolis, Ind.; Detroit, Grand Rapids, Mich.; St. Joseph, Mo.; Sioux City, Iowa; Hastings, Neb.; Parsons, Kan.; Cedar Rapids, Iowa; Springfield and Clinton, Ill., and Louisville, Ky., besides branches without creameries in Atlanta, Ga., and St. Louis, Mo.

The Fleet Make-up

The present make-up of the Blue Valley fleet in New York City consists of twenty 1-ton Walker electrics, 2 Fords with commercial bodies, and one 1½-ton chain-driven Kelly-Springfield. The initial installation consisted of ten of the Walker electrics, which went into service in July, 1915. Then, as the business increased, it was found necessary to exactly double the first equipment by adding ten more Walkers of the same capacity. These were delivered in lots of one or more between July, 1915, and January, 1916.

The first gasoline vehicle, one of the Fords, was purchased in January, 1916, and the Kelly-Springfield a few months later. The gasoline vehicles are used for the longest of the routes, principally those in New Jersey, when the weather is rainy and the roads in poor condition for that reason, or when the snow is deep in the winter.

The area covered by this twenty-three truck fleet includes all of Manhattan Island, the Bronx, Brooklyn and Queens, Yonkers and the New Jersey points of Edgewater, Ft. Lee, Hackensack, East Rutherford, Nutley, Ridgefield Park, Ridgewood, Midland Park, Bogota, Tenafly, Westwood, Emerson, Dumont, Norwood, Closter, Cresskil and Bergenfield.

Sixty-nine Routes in All

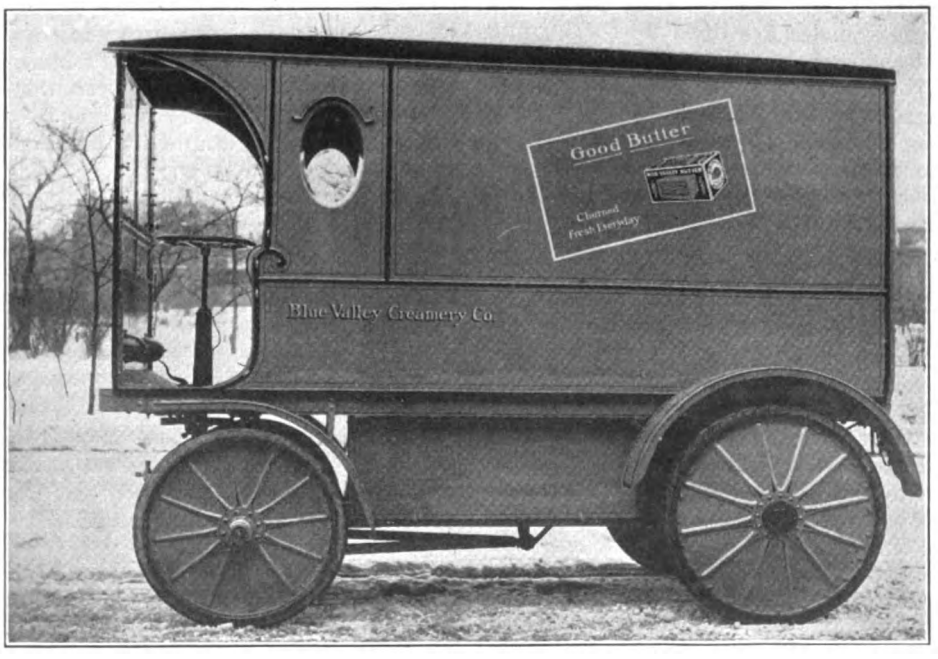
This territory is divided into sixty-nine routes, three of which are covered by each of the twenty-three salesmen and twenty-three trucks twice a week. The company maintains no salesmen on foot, but depends upon the ability of its truck drivers to hold the present business and to secure new accounts after the goods carried on each trip have been delivered.

Drivers Must Be Salesmen

This makes it necessary that the truck driver be a good salesman first and a good driver second. These conditions have been met very satisfactorily through the use of electric trucks which usually do not require the same amount of attention as the conventional gasoline truck. The drivers do none of the vehicle repairing or adjustment, this being attended to by one mechanic in the garage.

Under these conditions, the Blue Valley drivers are vastly different from the usual class of motor truck operators. They must be neat, good salesmen, and more intelligent than the men ordinarily met with on commercial vehicles. Having to have somewhat unusual qualifications, they are paid better than the average driver, receiving about $18 per week to begin, and as much above that amount as the volume of business they obtain warrants. Some of the drivers make as high as $26 a week, and on some occasions as high as $35, these wages being based on a certain percentage of the weekly business done. In fact, they are not kept on the rolls if they cannot earn more than $18 per week under ordinary conditions.

The trucks leave the store of the company, which is located at 2292 Twelfth Avenue, near One Hundred and Thirty-first Street, at about 7 a. m. in the morning, and return not later than 5.30 p. m. under ordinary



The type of Walker 1-ton electric used for the delivery of the Blue Valley company's products in and around New York City. In keeping with the company's name, the trucks are painted a pleasing blue color with trimmings and lettering in gold. These are the two colors used in all of the concern's advertising, so that the vehicles are made to carry out the company's advertising policy as expressed in its billboard signs, street-car placards, etc.

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conditions of running. All of the trucks, the gasoline as well as the electrics, average between 40 and 50 miles a day, the electrics doing this mileage without the necessity of boosting.

Each truck makes between 50 and 115 stops per trip, depending upon the particular territory and the degree to which it is built up. Each day after each driver has delivered his load to the customers, he visits other storekeepers in his territory in an endeavor to obtain more business. The driver also collects the money for the goods delivered, and turns it in each night at the office, at the same time leaving the orders for the next trip on that particular route.

Three Trucks Used As Route Builders

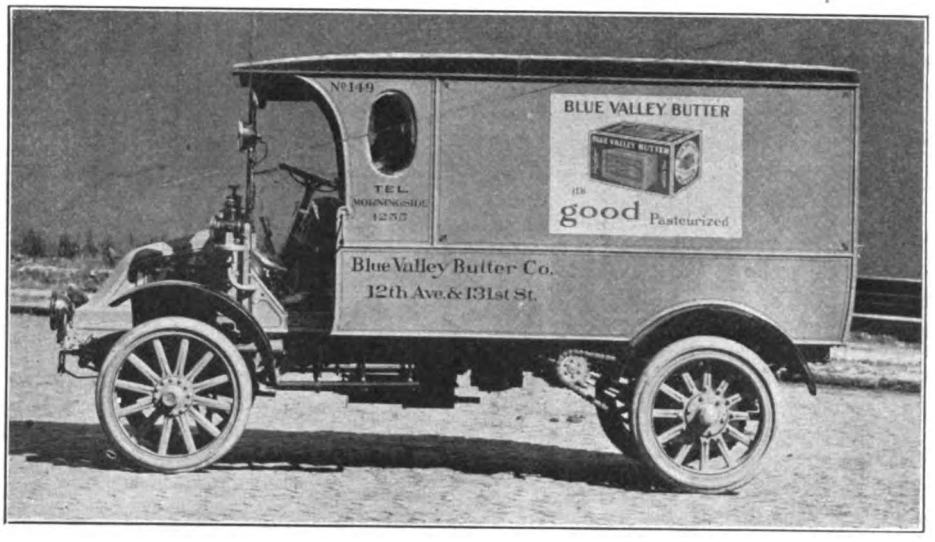
Besides the regular routes served, three of the trucks are also employed as what are called route builders. One Walker is used in Brooklyn for this purpose, and a Ford and another Walker for the same work in New York City. This has been found necessary in congested territory, where the number of customers to be served is so large as to take up all the driver's time in making deliveries with none left in which to solicit new business.

On arrival at the plant each morning, the driver loads his own truck with the assistance of one or more of several helpers, two of whom work in the refrigerator during the day, and another four in the egg department. Although the company's main business is in print butter, it also sells tub butter, cheese and eggs, all of which is delivered by the trucks. The vehicles are lined up for loading at the curb, and the goods transported from the store to the tailboards by means of small handtrucks. Those of the vehicles which have to cover the longest routes are loaded first in order to insure their getting home at the same time as the others.

Trucks Kept in Public Garage

All the trucks have been maintained in a public garage about four blocks, or less than half a mile away from the store, since January, 1916. Previous to that time, they were kept at the service station of the International Motor Co., at West End Avenue and Sixty-fourth Street, about 3½ miles distant from the Twelfth Avenue station. This considerable unproductive mileage between the store and the garage every morning and evening, and amounting to about seven miles a day, was considered excessive, and resulted in the transference of the vehicles to a garage nearer the store as stated.

The trucks are garaged on a monthly basis, which includes charging in the case of the electrics, and also washing each night for both electrics and gasoline cars. This nightly washing is considered necessary because the vehicles must be spotlessly clean in order to be consistent with the company's policy of purity of product.



The 1½-ton Kelly-Springfield purchased by the Blue Valley company during 1916 for use principally on its longer New Jersey routes when the roads are soft or transportation is held up by deep snow during the winter months. It is a chain-driven model and is equipped with an electric lighting and starting system

One Mechanic for Minor Repairs

The Blue Valley concern carries one mechanic on its rolls. He is stationed at the garage to make any minor repairs and adjustments which are necessary. The major repairs are done at the service plants of the three companies from which the three different types of vehicles were purchased. It is the opinion of the company that this method of maintenance is cheaper and less troublesome than would be the case were it to erect a garage building of its own and maintain it exclusively.

The mileage record of each of the trucks is taken weekly, although the ampere-hours of current consumed in charging the battery is taken every night. The trucks are all equipped with speedometers, but not with any form of recording devices. These are not considered necessary, for the reason that the salary paid each driver depends entirely upon the amount of business he does in any given week, so that it is to his own best interests to cover as much ground as possible.

The drivers are retained according to their ability as salesmen. If any particular applicant for a position proves that his past record shows his ability as a salesman, he is then taught how to drive one of the electrics, which consists simply of being able to turn the power on and off and applying the brakes at the proper time, together with a certain amount of self-confidence while driving on the road.

Few Tow-ins Necessary

Since the first year, very little trouble has been experienced with the electrics running out of current while on the road, only two tow-ins having been necessary since that time. This has been due to a greater knowledge by the men in charge of the trucks of the varying conditions which the vehicles have to meet on the different routes under varying weather conditions. In fact, on occasion, one of the electrics is sometimes sent out to cover the longer routes in New Jersey usually served by the gasoline vehicles. All of the electrics are equipped with Edison A-6 storage batteries.

SEVEN MAKES AT MONTREAL SHOW

MONTREAL, QUE., Feb. 3—The Montreal Automobile Show just closed was one of the most successful yet held under the auspices of the Montreal Automobile Trade Assn. In point of attendance, number of exhibits, and commercial vehicles on display, all showed a large percentage of increase over last year's show.

Motor trucks are now a familiar sight on Montreal's streets during the winter months, whereas a few years ago it was an utter impossibility to convince buyers, who at that time were very skeptical as to the possibilities of running a motor truck during the winter.

The following exhibits were on display:

Canadian Pneumatic Tool Co., Ltd., Little Giant.
Legaree Automobiles, Ltd., Federal.
Girdwood Lamb Motors, Ltd., Reo.
Frigon & Baker, Chase.
Larivee, Inc., Smith Form-A-Truck.
White Motors, Ltd., White.
Albion Motors, Ltd., Republic.
Sawyer-Massey, Ltd., Sawyer-Massey.

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Motor Trucking Centers of America—V

PITTSBURGH

Iron City Wedged in Narrow Valley Between Hills—Most Streets Poorly Paved and Narrow

(Concluded from last issue)

Pittsburgh is one of the country's greatest industrial centers. It produces 40 per cent of the national production of finished steel, and this exceeds that of all Great Britain. It also produces 25 per cent of the national production of pig iron, and this exceeded that of all England previous to the war. Pittsburgh also stands pre-eminent in the production of coal. Within a radius of 40 miles of the city is produced 10 per cent of the world's bituminous output, which is 40 per cent of that of all of Great Britain and two and one-half times that of France. Pittsburgh has a total of eighty plants manufacturing the various forms of glass and glassware, with a total annual output valuation in excess of $55,000,000.

Pittsburgh Industries Diversified

While to the uninitiated, Pittsburgh is regarded solely as a manufacturing center of the iron and steel industry, with its allied products, the eighty glass factories mentioned above are but a few of the diversified industries of the city whose total annual output is valued at $117,000,000 odd.

Practically all of the large steel companies, like the Carnegie company in Homestead, the American Steel & Wire Co. in McKeesport, the American Bridge Co. in Hazelwood, and the Jones & Laughlin company, all within Greater Pittsburgh, maintain warehouses in the city itself. Each uses trucks to haul some of its products between its plants and warehouses, and for the delivery of food products to chains of co-operative grocery stores maintained for the benefits of the great army of workers.

More Trucks in Retail Delivery

Brewers, wholesale grocers, and gravel concerns, plumbers and miscellaneous manufacturers of all kinds are employing trucks. Although such concerns as brewers and grocers have used trucks in small number in the past for wholesale deliveries, it is their employment of them in the retail delivery which has helped swell the total for the past year. Practically all of the trucks put in service during 1916 have been of the higher grade. This has been due to the severe conditions which the city's physical conditions impose and the advance knowledge that vehicles which are not ruggedly built and put together are doomed to failure.

Even the municipal departments are fast becoming motorized. The police patrols are now entirely horseless, and the fire department is partially motorized.

The post-office department has been exclusively motorized since Nov. 1, 1916, when forty-eight government-owned and maintained vehicles went into service. This fleet displaced sixty horse wagons and two electric street railway cars under contract.

The present mail fleet is made up of twenty-eight Fords, fifteen ¾-ton Whites and five 1½-ton Packards. The Whites are mounted on cushion tires and the Packards on conventional solids. The Whites are operated at speeds of from 20 to 25 miles per hour. Under these conditions, and in view of the poor street pavements, the cushion tires are not giving entire satisfaction in that they are not cushioning the driving mechanism of the vehicles to a sufficient extent. It is proposed to fit pneumatics instead.

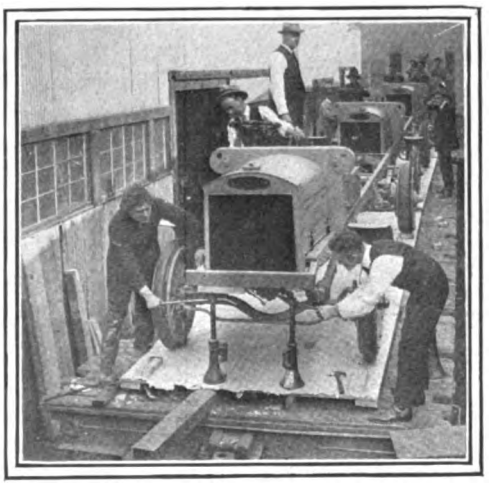
The Packards are employed to transfer mail from the eight railway depots and the central post office; the Whites to transfer mail between the depots, the central office and twenty-two carrier stations, and the Fords for the collection of mail from street boxes and for the collection and delivery of parcel post matter.

Mail Trucks Work 16 Hours

All of the vehicles are in operation 16 hours out of the 24. They are maintained by a crew of 52 drivers and 36 carrier drivers, each of which works on an 8-hr. shift. The carrier drivers are paid at the same rate as if they delivered mail in the usual manner. The drivers do nothing but drive the trucks, a crew of a chief mechanic, six mechanics and two helpers being employed to inspect and keep the vehicles in condition. The trucks are being maintained in a hired garage under governmental supervision.

While the number of trucks in Pittsburgh has increased largely during the past year, few of the concerns owning them are as yet well educated in their proper operation. There is a large field for competent motor truck superintendents in the city, men who are enough executives to purchase materials and supervise the operation of the vehicles, and at the same time sufficient of mechanics to know when the trucks are being properly attended to to give the most beneficial results.

As a motor truck manufacturing city, Pittsburgh boasts of but one concern actively engaged in manufacture. This is the Lange Motor Truck Co., producing 1- and 2-ton trucks, which it sells within 100 miles of the city. It has a present output of about 75 trucks a year, but has broken ground for the erection of a new plant, in which the production will be more than doubled. The Pull-More Motor Truck Co. is erecting a plant in Newcastle, Pa., at which it will manufacture a front-wheel-driven truck of unusual design, in that the power plant or front end may be detached from the body, and in which the entire cab and power plant can be revolved about a longitudinal axis to provide motor accessibility.



Boxing a shipment of four Morelands for shipment to Antofogasta, Chile

Moreland Exporting Trucks to Pacific Ports

South America and the islands of the Pacific, as well as Australia, are drawing on the United States for motor trucks, and the demand, although small at present, is gradually increasing. In a single week near the close of 1916 the Moreland Motor Truck Co., Los Angeles, Cal., shipped four trucks to Honolulu, one to Sidney, Australia, four to Chili, and one to Bolivia. The truck for Bolivia will be used in the mountains with another delivered some 3 months ago. It will displace mountain burros, and notwithstanding the fact that fuel costs $1 per gal. at this point, the truck already in service has demonstrated its ability to make a large saving.

Shipping conditions at Los Angeles harbor, from which these trucks are exported, are improving constantly, but the Moreland company calls attention to a point which will be of interest to all exporters drawing trade from ports with which American trade relations have not been fully developed. One of the principal handicaps to an exporter having a bulky product is the lack of shipping space, due to the absence of regular imports of considerable volume. At Los Angeles harbor, for example, oftentimes a vessel will come in from South American ports, discharge 300 or 400 tons of import freight and find three or four times as much export freight waiting to go in the space made vacant by the imports. Export business therefore, from a shipping standpoint, must go hand in hand with the import business, and one of the most effective ways to help the shipping and banking factors in exporting is to work out some means of assisting in developing import business from ports with which trade relations are anticipated.

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The Finishing Touches

AMERICAN design can stand the test of comparison with the best that Europe produces as far as essentials go. Word has come from Germany recently, indeed, that many of the old practices have been discontinued and that the Teutons are following the American lead in making their chassis lighter, more flexible and with larger wheels. In detail, however, there is much improvement which Americans will have to make in order to be on a parity with the Italians, the Germans, the Belgians.

Much of this detail improvement does not involve additional expense, but merely represents a better alternative. Many of these refinements have not been made purely because their advantages have not been made sufficiently clear to the designers. This in turn is because with our large-production methods and highly-developed standardization, our designers are not as close to the ultimate purchaser as are those of the European shops. To the European factory a sale is more nearly an event than an incident, as in this country.

Longer Exhaust Pipes

One of these flaws is in exhaust pipes. Several of our latest designs have exhaust outlets entirely in front of the body. Most of them open some few feet ahead of the tailboard. The cost of the extra length of piping is trifling, and, as has been found in racing practice, a long pipe actually decreases back-pressure and emits less smoke. Many trucks have been installed in the service of dealers in easily-tainted goods. Butter, meats and other foods, flowers, confectionery, etc., are easily spoiled if exhaust fumes are permitted to pollute them.

Another detail that is susceptible of improvement is the radiator and fuel tank caps. Here the evil is not so general; but poorly-designed caps are decidedly common. Some of these caps are made of brass with fine pipe threads and hard rubber tops with a shallow knurling at their edges. The brass threads are easily battered in filling, in some cases, for if they be on the inside of the neck of the radiator or tank, they will be damaged by the funnel. If on the outside, the edge of the bucket is liable to smash them.

When they do become damaged or crossed through an attendant trying to put the cap back on too hurriedly, it is sure to jam and to require considerable effort to remove. The knurls give a very poor purchase and the use of a tool is impossible due to the fragility of the rubber composition. A hinged cap is to be preferred by all means and a quick-acting cam clamp is much to be preferred to any arrangement of eye-bolts and thumb-nuts to lock the hinged cap in place.

No doubt there is good reason for mounting the fuel tank under the seat, but there seems no reasonable excuse for having the filler cap so covered by seat boards, seat cushions, cab and driver that the simple operation of gasing-up consumes minutes instead of seconds. The location of a tank under the seat can be robbed of most of its disadvantages by extending the filler spout through the front board of the seat, or, better yet, out to the side. If thought best, the vent can be under the cushion, to protect it from water and dust and the cap itself a hermetic seal.

Now that automatic equalizers are in almost universal use in brake linkages, there seems to be no further reason for fitting adjustable clevises at all rod ends. The money which could be saved by using plain clevises on the rods could be well spent by fitting accessible single adjustments. Such an adjustment may be made an integral part of the brake pedal or lever or it may be extended to the side of the truck with a hollow tube connection which may carry grease from a filler plug or grease cup integral with the adjusting wheel or lever. Such an adjusting appliance should be made large enough to be turned by hand with one's gloves on and should be locked by a spring plunger, so that tools are not necessary.

There have of late been several surprising blunders on the part of concerns of long experience in the matter of brakes. It is a great surprise to find trucks offered on the 1917 market with simple single-wrap brakes which of their very nature cannot be controlled nicely and which have practically no retarding effect whatever in a reverse direction.

Real Tool Boxes

To make adjustments easy, lubrication points accessible and tools convenient is the soundest sort of insurance against neglect and it is surprising that American designers have not given more attention to these matters. Regarding tool boxes, it seems a little unreasonable to place the fuel tank at the extreme rear of the chassis, with a long line of frail tubing to the engine and the tools under

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the driver's seat, where, if he is human, he is most apt to let them lie rather than go to all the trouble necessary to get at them when a small, but important adjustment or repair is to be made—especially in unpleasant weather. How much more logical to put the tank under the seat with an outboard filler spout and place the tools in a box alongside the cab.

By the latter is not meant the dinky little tobacco tins that one finds precariously perched on running boards. What good are running boards anyway? Why not a real tool box, containing a good pair of jacks, some man-sized wrenches, a good sledge or axe and possibly a folding shovel in addition to the usual line of small tools. Why put it so low on the useless running board that the driver must assume an attitude of prayer to reach it. Put it waist high and make it part of the cab—as though it belonged to the truck; not as an after thought.

Perhaps one of the most important ways in which the operation of a motor truck may be made more convenient without extra cost is in the location of controls. Gearshift levers which permit the lever to be put in the forward notches of the gate without bending the body; which are placed so that the hand in leaving the wheel naturally falls upon them; pedals which push in a natural and easy direction and which permit the foot to rest on them when fully back without the knees interfering with the steering wheel; steering columns with a rake which makes for comfort and natural feeling of direction; and seat cushions which slant backward sufficiently to avoid that continual sliding-forward feeling, are no more expensive than faulty arrangements of these details.

These random thoughts are not iconoclastic in intent, but are merely suggested improvements which can be made at no special expenditure save of thought and observation. Our most vivid and lasting impressions come to us subconsciously and as a result of minor influences too apt to escape notice. Little refinements and comforts of this sort may very conceivably instill in the driver a real regard for his mount instead of an indifference born of minor frets.

Empire State May Revise High Truck Tax

Governor Whitman Acts on Protest of Owners

NEW YORK CITY, Feb. 13—The despair of motor truck owners and operators in New York State who had to face the possibility of paying truck fees of from double to fourteen times those of 1916 by the passage of the Hewitt-Wells bills on Jan. 24 has been changed to one of conservative optimism. This is the result of the attitude of Governor Whitman, who promised to create a new commission to determine a new schedule of fair and equitable fees at a public hearing held before him on Feb. 6.

This hearing was attended by a large number of operators of large and small fleets of trucks all over the State, by motor truck dealers and by the legal representatives of the Motor Truck Conference Committee, including Charles Thaddeus Terry for the National Automobile Chamber of Commerce, Charles G. Bond for the Motor Truck Club of America, and John J. McInerney for the State Federation of Motor Clubs.

Object to Methods Used

The speakers at this hearing, which was well conducted by Roderick Stephens, president of the Motor Truck Club of America, pointed out that the Hewitt-Wells bills were unfair for two main reasons, the first because they were railroaded through both houses without adequate hearings and secondly, because the fees or taxes which they sought to legalize were based upon the weight of motor trucks alone and upon seating capacity in buses and in no way took into account the considerations of the damage done to the roads and the extent of use of the roads, both of which requirements were specifically stated in the law under which the Truck Fee Commission which compiled the schedule was formed.

New and Better Commission

These arguments were so convincingly put forth that the Governor practically agreed to form a new commission, to consist of a road engineer, a State engineer and a motor truck engineer, to make a scientific report on the entire matter and then report back to the Legislature for final action.

The next day following the hearing Senator Murphy introduced a bill in the Senate providing that such a commission be appointed by the Governor, and similar action was taken by Assemblyman Law in the Assembly. Due to the known favorable attitude of Governor Whitman as expressed at the public hearing on Feb. 6, it is not thought that any difficulty will be experienced in passing these two bills.

Another bill of perhaps equal importance was introduced in the Senate by Senator Slater and provides for the exemption of motor trucks and buses from local and general taxation in lieu of the present increased fees as ratified by the Hewitt-Wells bills. If the Slater bill is passed, and from indications it seems that it will, motor truck owners and operators will have much cause for rejoicing because the personal property and local taxes are of greater amount than the registration fees in practically all cases. If trucks are thus exempted from these taxes, they will be in the same class as the passenger cars in the State so far as a single tax is concerned, for they have paid no personal property tax since the present fee of a fixed sum per horsepower rating went into effect several years ago.

The Silver Lining

The great benefit accruing from the exemption of local and general taxation on trucks and buses may be gaged by a comparison of two or three sizes of

(*Continued on page* 21.)

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Government Owns 539 Postal Trucks

Eight Large Cities Served by Fleets of from 8 to 228

WASHINGTON, D. C., Feb. 8—In eight large cities, the U. S. Post Office operates 539 motor trucks in postal work, the installation of these vehicles having followed a thorough investigation by a committee of three experts in three cities, consisting of Frank Galbraith, Chicago, a Mr. Simmons in Minneapolis and Mr. Phelan, New York City.

Previously the government had hired its transportation, done by local teaming concerns on contracts covering usually about 4 years. These contractors, by employing motor trucks, so improved the service, economizing in cost at the same time, that it was determined, if feasible, to motorize the service in several prominent cities, thus insuring against the possible reversion to horse vehicles, and to have such motorization under government ownership so as to insure consistent and reliable service at a minimum cost.

The trucks are used for parcel post delivery and collection, interstation work and transfer of mail between the post offices and railway depots. They range in capacity from 750 lb. to 3½ tons, representing eight makes of chassis.

The greatest number are in Chicago, that city having 228. Fords lead in number, there being 312 of these in the eight cities, of which number seventy-six have Olson converters to raise their capacity to ½ ton. The largest single fleet of one make consists of 100 unconverted Fords used in Chicago. Following is a tabular summary of the installations:

Cities	Number of Chassis
Chicago	228
Philadelphia	122
St. Louis	56
Detroit	49
Pittsburgh	48
Washington	19
Indianapolis	9
Nashville	8

Make	Number
Ford	312
With Olson Unit	76
White	135
G. M. C.	45
Studebaker	35
Packard	13
Buick	5
Kelly-Springfield	1
Overland	1

IN CHICAGO

Vehicles	Number	Work
750-lb. Fords	100	Pl. p. and col.
½-ton Studebakers	10	Pl. p. and col.
½-ton Ford-Olsons	35	Pl. p. and col.
¾-ton Whites	35	Int. and depot
1½-ton Whites	38	Int. and depot
3-ton Whites	10	Depot

IN PHILADELPHIA

750-lb. Fords	31	Pl. p. and col.
½-ton Ford-Olsons	26	Pl. p. and col.
½-ton Studebakers	14	Pl. p. and col.
¾-ton G. M. C.s	15	Int. and depot
¾-ton Whites	23	Int. and depot
*1½-ton Whites	2	Int. and depot
1½-ton G. M. C.'s	10	Int. and depot
3½-ton Kelly-Springfield	1	Depot

IN ST. LOUIS

750-lb. Fords	28	Pl. p. and col.
½-ton Ford-Olsons	4	Pl. p. and col.
½-ton Studebakers	4	Pl. p. and col.
¾-ton G. M. C.s	14	Pl. p. and col.
1½-ton G. M. C.'s	6	Int. dep. & col.

IN DETROIT

750-lb. Fords	28	Pl. p. and col.
½-ton Ford-Olsons	4	Pl. p. and col.
½-ton Studebakers	4	Pl. p. and col.
¾-ton G. M. C.s	14	Int. dep. & col.
1½-ton G. M. C.'s	6	Int. dep. & col.

IN PITTSBURGH

750-lb. Fords	28	Pl. p. and col.
¾-ton Whites	13	Int. and depot
1-ton Whites	2	Int. and depot
1½-ton Packards	5	Depot

IN WASHINGTON

750-lb. Fords	9	Pl. p. and col.
½-ton Ford-Olsons	1	Pl. p. and col.
¾-ton Whites	8	Pl. p., int. and col.
1½-ton Whites	1	Treasury run

IN INDIANAPOLIS

½-ton Studebakers	9	Pl. p. and col.

IN NASHVILLE

750-lb. Fords	5	Pl. p. and col.
¾-ton Whites	3	Int. and depot

Abbreviations: Pl. p., parcel post; col., collection; int., interstation.

CONTEMPLATE CO-OPERATIVE DELIVERY

DECATUR, ILL., Feb. 12—The Retail Grocers' Assn. of Decatur has been holding a series of meetings to discuss the co-operative system of delivery with motor trucks. Champaign and several other cities have made a success of the plan, and it was decided to send a delegation to each and report upon the workings of the system, with the expense to each member as compared to the present cost with individual delivery. If the Decatur business men decide to adopt the new plan, a central depot will be rented and a battery of cars purchased which will serve each member. By assigning one car to a certain district, much lost motion will be saved, and the merchants may greatly reduce their present expense. It is claimed in Champaign that the system greatly expedites deliveries, as well as reducing cost, and is giving entire satisfaction, not only to the dealers, but to patrons as well.

Coming Commercial Vehicle Events

Feb. 20	Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.
Feb. 20	Philadelphia, Pa., Monthly Meeting, Pennsylvania Section, S. A. E.
Feb. 21	New York City, Monthly Meeting of the Motor Truck Club of America, Automobile Club of America, 247 West Fifty-fourth Street.
Feb. 21	Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.
Feb. 24-Mar. 3	Newark, N. J., Passenger Car and Motor Truck Show, First Regiment Armory.
March 3-10	Boston, Mass., Fifteenth Annual Motor Vehicle Show, Mechanics' Building.
March 6-10	Brooklyn, N. Y., Motor Truck Show, Twenty-third Regiment Armory.

'Frisco as a Producer of Motor Trucks

Four Companies Built 255 in 1916—Exported Some

SAN FRANCISCO, CAL., Feb. 3—San Franisco has developed into a manufacturing center for motor trucks. It is a noteworthy fact, furthermore, that unlike other centers where perhaps a greater production is found, a large proportion of the parts going into the make-up of its vehicles are manufactured by the builders. In the year ending last October San Francisco plants turned out 255 trucks worth $658,000, and the outlook for the next 12 months indicates an increase of as much as 100 per cent.

How far this special parts manufacture extends is indicated by the fact the Hewitt-Ludlow Auto Co. is the only manufacturer of a worm-driven axle west of the Mississippi River. The parts of the Doane are nearly all made by the Doane Motor Truck Co., for with its cranked axles and unusually low suspension few standard parts can be adapted.

There are four manufacturers of more or less importance in San Francisco, as follows: The Hewitt-Ludlow Auto Co., Kleiber & Co., the Doane Motor Truck Co. and F. J. De Martini. Not only do San Francisco-made trucks find a market throughout the Pacific Coast, but they are exported to Australia, Central and South America and Mexico.

THREE BUILDINGS FOR BOSTON

BOSTON, Feb. 2—Boston's motor show is swelling up to gigantic proportions and now it has been found necessary to add a third building. The main show will be in Mechanics' Building, the usual place. There will be the Salon at the Copley Plaza for cars of $2,500 and upward, and the overflow will be held at Horticultural Hall further along Huntington Avenue, where there was an overflow a few years ago.

BROOKLYN SHOW MARCH 6-10

NEW YORK CITY, Feb. 6—The first motor truck show to be held in Greater New York since 1912 will open in Brooklyn March 6, at 2 p. m., at the Twenty-third Regiment Armory and will close at 10:30 p. m. on Saturday, March 10. This show is to be held by the Brooklyn Motor Vehicle Dealers' Assn., which is holding a passenger car show Feb. 26 to March 3.

Formerly both passenger cars and trucks were shown at the same exhibition, but this year it was found that the applications for space from the truck dealers were so many that it was impossible to accommodate all of them in the passenger car show and still have room for all of the passenger car exhibits.

As matters now stand, I. C. Kirkham, who has the allotment of space in charge, expects the truck show to be as large, in point of number of exhibits, as the passenger car show. Very little space is still available and it is feared that some intending exhibitors will be disappointed.

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Truck Exports Less—Value Higher

1916 Exports, 18,903 Vehicles Valued at $52,870,774

WASHINGTON, D. C., Feb. 2—Exports of commercial vehicles from the United States in 1916 were 14.5 per cent under those of 1915 in point of numbers and 11.7 per cent in value. This was expected, and the fact that the value of exports is relatively higher than during the year previous indicates that the remaining business is of a high order. The average price of the trucks exported last year was about $2,700, while the average 1915 price was about $2,625.

December exports were disappointing, being 1331, valued at $3,688,314, as against 1664, worth $3,920,533, the year previous.

	1915.	1916.
Trucks	22,082	18,903
Value	$59,834,246	$52,870,774

FRENCH TESTED MORELAND TRUCKS

LOS ANGELES, CAL., Feb. 2—M. W. Ferguson, technical representative of the Moreland Truck Co., of Los Angeles, Cal., has recently returned from France, where he has been observing trucks in service under military conditions, and in charge of Moreland distillate burning trucks tested by the French military transportation authorities. The Moreland trucks were fully tested during a period of 2 months. Distillate, the asphalt-base, low-grade fuel used on the Pacific Coast in Moreland trucks, is not found in France, and they were tested on kerosene on a grade which Mr. Ferguson considers poorer than the kerosene of the eastern United States.

U. S. BUYING CREEPERS

WASHINGTON, Feb. 6—Sealed proposals will be received at the office of the chief signal officer, War Department, this city, until Feb. 20, 1917, for furnishing track-laying tractors of medium horsepower. The proposal number is 912.

BOSTON BANK IN BUENOS AIRES

BOSTON, MASS., Feb. 6—A Buenos Aires, Argentina, branch of the First National Bank of Boston has just been opened under the management of Noel F. Tribe, who has resided in The Argentine for the past 20 years. The new branch is intended for the service of American firms doing business in Argentina and for the active promotion of Latin-American exports.

GERMAN TRUCKS MORE LIKE OURS

NEW YORK CITY, Feb. 7—According to recent advices from Germany, the effect of the war has been marked in the design of German commercial vehicles. The trend has been toward American ideals of construction rather than the German, since it has been found that the pristine design was too rigid for successful negotiation of rough roads; that clearances were too low for new roads; that the vehicles were too heavy, and that their wheelbases were often too long for a short enough turning radius.

The Germans have also recently had an opportunity to study American design, for in the *Yarrowdale*, which the Germans captured, were not only Americans, but American trucks, consigned to the Allies. From their description as of the Bulldog type it is inferred that they were Kelly-Springfields. They are being used by the city of Berlin for the carrying of coal.

Hansa Lloyd, at Bremen, is now producing a standard truck design which in both appearance and construction resembles American practice. These trucks are of 2-tons capacity, they have shorter wheelbases, higher wheels and considerably more clearance.

Coast Stages Under Public Service

Golden State Passenger and Freight Lines Affected

LOS ANGELES, CAL., Feb. 3—By a decision of the Supreme Court of California jurisdiction over rates and operation of interurban bus lines is vested in the state railroad commission. This holding was made in an action brought to show jurisdiction of the commission by the Association of Short Line Railroads against the Wichita Transportation Co. and Peninsula Rapid Transit Co. The Wichita Company runs a line of trucks between San Diego and Imperial Valley points and the Peninsula Company operates passenger buses between San Francisco and San Mateo.

The court in a limited decision ruled that the commission has supervision over both freight and passenger motor carriers under three conditions: When they are common carriers of passengers or freight; when they run on regular schedules; when they run on regular routes on public highways and between fixed terminals and are not operated solely within the limits of one municipality.

The court, however, declined to rule that these transportation companies are subject to all the provisions of the Public Utilities Act, which in addition to giving the railroad commission jurisdiction over rates and schedules of all public utilities, makes all issues of securities by these utilities subject to authorization by the commission and requires the companies to obtain from the commission before beginning operations, certificates that public convenience and necessity require their operation.

Under this decision of the Supreme Court, the State Railroad Commission has ruled that interurban bus lines must file schedules of their rates and time tables with the commission before March 1.

CHICAGO USERS PROTEST FENDERS

CHICAGO, Feb. 2—Probably the most vigorous protest against Chicago's truck fender ordinance will be lodged Thursday with the chief of police, in answer to his call for a meeting of the truck owners of Chicago to determine how long it will be before they can equip their trucks with the fenders, demanded by the present ordinance. It is expected that 300 representatives of the commercial vehicle users in the city will be present, to show the impracticability of the fenders called for.

Torbensen to Double Plant Capacity

Produces New Front Axle Line —3½- and 5-Ton Rears

CLEVELAND, Feb. 10—An addition of 30,000 sq. ft. is being made to the plant of the Torbensen Axle Co., on East One Hundred and Fifty-second Street, to consist of two buildings, one at the rear of the main factory, 220 by 100 ft. and the other at the front, 100 by 80.

These annexes will be completed in about 60 days' time and will cost $150,000. It is expected that these additions will permit the concern to double its output this year. It is said that 30,000 axles were manufactured last year and 60,000 are contemplated for this. Some of these will be the new front axles which the concern is bringing out, of which there will be a complete range of sizes. Two new internal-gear-driven rear sizes, for 3½- and 5-ton trucks, are being brought out.

A dividend of 10 per cent on its common stock and the usual dividend of 1¾ per cent on preferred has just been declared.

DETROIT TO GET PACKARD HALL

DETROIT, Feb. 2—Detroit is to have a great auditorium—a long-felt want—if the plans of the Packard Motor Car Co. mature. As a part of the new sales and service building of the Detroit branch of the Packard company a hall suitable for the artistic, social and political needs of the city is planned. The building will be an eight-story one, 236 x 200 ft. The auditorium will have a single sloping floor and a stage with seating for 2500 people. Construction will start June 1.

FUEL NOW STANDARDIZED

DETROIT, Feb. 7—Motor vehicle engineers and oil company representatives met here today and agreed on a gasoline ordinance. The ordinance proposed calls for one grade of fuel which will show a total of 20 per cent boiling at 220 deg. Fahr. The fuel can either be distillate or cracked. The experts from the oil companies wanted 16 per cent boiling at 212 deg., claiming it better for warm weather, but the engineers refused, stated it unsatisfactory for winter and the 20 deg. was named instead.

Those in attendance at the meeting were Inspector J. C. McCabe, Municipal Safety Engineering Dept.; C. C. Hinkley, chief engineer of the Chalmers company; W. O. Thomas, consulting engineer; A. R. Miller, E. D. Johnson of the Indiana Standard Oil Co.; J. Rath, Rath Oil Co.; K. W. Zimmerschied, chief metallurgist of the General Motors Co.; Russell Huff, chief engineer of the Dodge company; G. Holley of the Holley Bros. Co.; D. McCall White, chief engineer of the Cadillac company; J. G. Vincent, vice-president of the Packard company; Guido Behn, chief engineer of the Hudson company, and R. L. Francis of the Central Oil Co.

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Independent, a New Western Truck

To Build a Truck at $1,100 in Davenport, Iowa

DAVENPORT, IA., Feb. 3—The Independent Auto Truck Co. will open a plant in this city to build a truck selling at $1,100. The company will be incorporated for $50,000, the incorporators being Charles Zoller and E. August. Mr. Zoller is president.

Three buildings, comprising the southwest portion of the Independent Brewing & Malting Co., have been converted into a manufacturing plant. About 24,000 sq. ft. of floorspace will be utilized by the company. With the exception of the axles all the parts will be manufactured at the local plant.

JANUARY BIG FOR PACKARD

DETROIT, Feb. 10—January saw $2,262,500 worth of Packards purchased by American buyers, most of which were sold as stripped chassis for local application of bodies. This is the biggest month's business ever done by the company and does not include any exportations, samples or demonstrators. Most of the sales were in New York, Chicago, Boston, Cleveland, Detroit, Pittsburgh and Philadelphia. Minneapolis, Portland, Ore.; San Francisco, New Orleans, Cincinnati, Rochester and St. Louis also made substantial gains.

The largest single sale was for 131 trucks. Among the biggest buyers were Swift & Co. and Armour & Co., Chicago packers; Liquid Carbonic Co., Chicago Telephone Co., Standard Oil Co., Anheuser-Busch Brewing Assn., New England Gas & Coke Co., Edison Electric Co. and the Independent Oil Co.

F. W. D. AFFLUENT

CLINTONVILLE, WIS., Feb. 3—A stock dividend of 100 per cent and a cash dividend of 15 per cent were declared by the Four Wheel Drive Auto Co. of this city at the annual meeting held here Jan. 23. The stock dividend increased the capital from $500,000 to $1,000,000 and the cash dividend made a total of 30 per cent for the fiscal year of 1916, a previous 15 per cent having been paid July 1. Nearly 90 per cent of the stockholders were present and all of the officers were re-elected.

NILES TO MAKE TRUCKS ONLY

YOUNGSTOWN, O., Feb. 8—The Niles Car & Mfg. Co. of this city has determined to abandon its former business of manufacturing trolley cars and to devote its entire attention to the production of motor trucks, of which it now makes 1- and 2-ton models. New 3½-ton and 5-ton types are shortly to appear.

RAINIER IN FULL SWING

NEW YORK CITY, Feb. 2—With a national distribution in eight prominent truck centers as an outlet and its new factory in Flushing, Long Island, N. Y., as a source, the Rainier ½-ton truck is now actively on the market. The New York City branch on Broadway has been used as a general office for the company pending the completion of the factory, but is now used solely for local retail sales. The new factory is now producing at capacity and shipping ten trucks daily. The new agencies are:

W. W. Barnett, Denver, Col.
Reliance Automobile Co., San Francisco, Cal.
Greer-Robbins Co., Los Angeles, Cal.
Paige Motor Sales Co., Seattle, Wash.
Jones Motor Co., Pittsburgh, Pa.
Lexington Motors Chicago Co., Chicago.
M. G. Bernin, New Orleans, La.
Motor Sales Co., Baltimore, Md.

UNION GOING AHEAD

BAY CITY, MICH., Feb. 2—The Union Truck Co. of this city held its first annual meeting last week and re-elected the original directors as follows: W. Foss, J. R. Tanner, H. E. Buck, C. B. Chatfield, W. Boutell, H. P. Woodworth and L. W. Hine. Officers elected were J. R. Tanner, president; G. Beaulier, treasurer; L. W. Hine, secretary, and H. P. Woodworth, general manager.

The business for the first year was considered very satisfactory. The company is now establishing agencies throughout the country.

REVIVE DAYTON TRUCK

DAYTON, OHIO, Feb. 2—J. M. Dunwoodie, B. S. Murphy and other local business men have purchased the plant of the Durable Dayton Truck Co., this city, and have formed the Dayton Motor Truck Co. to resume operations at this plant. The company will have a capital of $50,000 and will manufacture both worm and chain-driven motor trucks of from 2 to 7½ tons capacity. Mr. Dunwoodie, who was formerly sales manager of the Stoddard-Dayton company, has put the foreign business in the hands of Melchion, Armstrong & Dessau, New York.

NEW GARFORD ROAD BUILDER TRUCK

NEW YORK CITY, Feb. 10—A brand new model of a 6-ton truck called the Road Builder has just been brought out by the Garford Motor Truck Co., Lima, Ohio. It is a vehicle built especially for road construction work, and while it still retains the characteristic Garford steel Roman dash with the engine between the seats and final chain drive, it differs from all previous Garford trucks in that it has a worm-driven jackshaft in order to secure a great gear reduction between the engine and the rear wheels.

It has a short wheelbase of 128 in.; steel wheels of West manufacture both front and rear, the former 40 by 10 and the latter 48 by 20; a steel dump body and a new type of wood hydraulic hoist. The engine is 5 1/10 by 5½, with a N. A. C. C. hp. of 41.61 and the valves placed opposite.

The truck has a total carrying or pulling capacity of 20 tons, the weight above the 6-ton load of the truck itself being carried in several four-wheeled trailers. A special double-spring drawbar is provided for connecting the trailers and an additional crosswise drawbar with seven attachment points for scarifiers, scrapers, etc. The truck was first exhibited in public at the Good Roads Show, which closed at Boston, Mass., last week.

Federal Capital Jumps to $2,000,000

7-Year-Old Company Pays 40% Dividend in 1916

DETROIT, Feb. 6—The Federal Motor Truck Co. will hold a special meeting of stockholders on Feb. 13 and will vote on the recommendation that the capital be increased from $500,000 to $2,000,000, and that a 100 per cent stock dividend be issued to shareholders through the transfer of $500,000 from surplus to capital account. The remaining $1,000,000 of new stock, par value $10, is to be retained in the company's treasury for future requirements.

During 1916 the company distributed 40 per cent in cash dividends, paying quarterly a regular dividend of 5 per cent and an extra dividend of 5 per cent.

The Federal company was incorporated in 1910 at $100,000, which was increased to $200,000 in 1912 by payment of a 100 per cent stock dividend, and to $500,000 in 1915 by a stock dividend of 150 per cent.

AMERICAN TRUCK OUT SOON

DETROIT, Feb. 7—The American Motor Truck Co., incorporated for $600,000, will begin work within 30 days on a plant in southwestern Detroit on the Michigan Central tracks.

FEDERAL 1- AND 5-TONNERS

DETROIT, Jan. 15—The Federal Motor Truck Co. will shortly begin the manufacture of two new trucks of 1-ton and 5-ton proportions. Mechanically they will be somewhat similar editions of the present 3½-ton truck and will include the worm-driven rear axle, heavy motor with five-bearing crankshaft of nickel-chrome steel, force-feed lubrication operated at a pressure of 150 lb., feeding all bearings, including the piston wrist-pins.

BRAZIL—A FRONT-DRIVER

INDIANAPOLIS, Feb. 4—The Brazil Motors Co. of Brazil, Ind., just incorporated with a capitalization of $150,000, has purchased the plant of the Brazil Fence Co., and will engage in the near future in the manufacture of a front-driven motor truck.

ACME BOOSTS PRICES

CADILLAC, MICH., Feb. 6—Owing to increased manufacturing costs an increase in the prices of Acme trucks will go into effect Feb. 15, not applying, however, to orders booked previous to that date. The 1-tonner will list at $1,575 instead of $1,500; the 2-tonner at $2,200 instead of $2,100, and the new 3½-tonner at $3,000 instead of $2,900, as had been planned.

PALMER PRICES TWISTED

In the item on the Palmer truck, made by the Palmer-Meyer Motor Car Co., St. Louis, Mo., in the résumé article in THE COMMERCIAL VEHICLE of Jan. 15, 1917, the prices for the two models were transposed. The price of the 1-tonner has been advanced from $1,350 to $1,500 and of the 2-tonner from $1,975 to $2,150.

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Pull-More Ready for Market in April

Million-Dollar Concern Is to Build Front-Driver

PITTSBURGH, PA., Feb. 1—The new plant of the Pull-More Motor Truck Co., New Castle, Pa., is fast nearing completion, the first 100 by 500 ft. unit being under roof and the machinery being installed. It is planned to begin manufacture by March 1, 1917, and to produce twenty-five Pull-More trucks during April. It is expected that the production will be increased to 100 per month by June 1, 1917.

The Pull-More Motor Truck Co. is a new $1,000,000 concern with the following officers: E. M. S. Young, formerly vice-president of the Standard Gage Steel Co., Beaver Falls, Pa., president and general mainager; Col. H. P. Bope, first vice-president and general sales manager of the Carnegie Steel Co., vice-president; Kenneth R. Cunningham, secretary and treasurer; J. M. Richards, formerly general superintendent of the Standard Gage Steel Co., works manager; H. H. Harker, chief engineer, and R. C. Spohn, sales manager.

The Pull-More truck will be manufactured in one model of 3 tons capacity and will sell at about $3,400 in the chassis, although this price has not been definitely fixed as yet. The vehicle has many unique features of construction not found on the conventional truck chassis.

The truck is described and illustrated in full elsewhere in this issue.

RECEIVER FOR CROWTHER

ROCHESTER, N. Y., Feb. 6—Friendly involuntary receivership has been entered by the Crowther Motor Co. of this city, manufacturer of the Crowther-Duryea roller-driven chassis for business and passenger purposes. Frank M. Spitsmiller of Buffalo received the appointment from Federal Judge John R. Hazel on petition of the Buse-Patten Co., parts makers and creditors of the Crowther company. It is said that the concern is solvent, but that it needs $1,000,000 to do business on a sound basis. But $36,000 worth of stock has been sold. It is said to owe only $3,000 for goods and to have an equity of $25,000 in its plant.

TO DOUBLE SMITH ADAPTER PLANT

CHICAGO, Feb. 2—Another plant for the production of Smith Form-A-Trucks is to be built upon ground which has been broken here. The new plant, according to E. I. Rosenfeld, president, will be of the same capacity as the present one, which has a capacity, it is said, of 30,000 a year. It is expected to be ready by May 1.

HAYES MADE 66,000 WHEELS

ST. JOHNS, MICH., Feb. 5—At the annual meeting of the Hayes Motor Truck Wheel Co. the following officers were elected: President, C. B. Hayes; vice-president and treasurer, N. S. Potter; secretary and general manager, A. D. Smith; vice-president and timber manager, W. C. Morrey; superintendent, H. J. Kellar. These officers, with W. C. Durant, compose the board of directors.

A report of the year's progress showed 66,000 wheels were manufactured, bringing $260,000. The payroll now covers 145 men. Prospects for 1917 were reported as good, enough orders being on the books to obviate the possibility of a shutdown during the year.

BEIJER HYDRAULIC DRIVE PROGRESSES

STEVENS POINT, WIS., Feb. 3—All of the officers of the Beijer Hydraulic Transmission Co., this city, were re-elected at the annual meeting, as follows: President, N. A. Week; vice-president, R. K. McDonald; secretary-treasurer, F. D. Reynolds, and manager, Arthur Beijer. The company has completed the installation of its system in several models of vehicles for demonstration purposes.

PACKARDS HAVE FOUR BEARINGS

In the specifications of Packard trucks which were published along with those of other makes in the issue of Nov. 1, 1916, errors due to mistakes in filling out the specification sheets were made. To correct these THE COMMERCIAL VEHICLE has been informed that all Packards have four-bearing crankshafts and that all governors are of the centrifugal type.

NEW BROWN-LIPE OFFICERS

SYRACUSE, N. Y., Feb. 2—Changes have been made in the personnel of the Brown-Lipe Gear Co. as a result of the withdrawal of H. W. Chapin, former treasurer and general manager, to concentrate his energies upon the general management of the Brown-Lipe Chapin Co., although retaining a place on the board of directors and a financial interest in the parent concern. His work has been divided between Arthur E. Parsons, senior partner of the firm of Parsons & Bedell, patent attorneys, and E. H. Hungerford. The new staff is as follows:

Alexander T. Brown, president; Willard C. Lipe, first vice president; George W. Sponable, second vice president; Arthur E. Parsons, secretary and general manager, and E. H. Hungerford, treasurer. These with Mr. Chapin form the board of directors.

1,000 ADAPTERS A MONTH

CHICAGO, Feb. 2—During the first 16 days of January, the Smith Motor Truck Corp. shipped 555 attachments. It is expected that the total for the month will exceed 1400. Operations in the closing months of 1916 were affected by the restriction of production on the part of chassis makers on account of the shortage in freight cars.

Contracts for 1917 by the Smith Motor Truck Corp. already received from agents aggregate 15,000. Shipments in December were 676 attachments; in November 697, in October 836, in September 679, and in August 1152.

NO 2¼-TON STEWART

In the item concerning the Stewart line published in the Résumé article in THE COMMERCIAL VEHICLE of Jan. 15, 1917, an error was made in designating the 2500-lb. model as of 2¼ tons. This obviously was an error, as the truck is of 1¼-ton capacity.

Bethlehem to Produce 10,000 Trucks

130,000 Sq. Ft. Floorspace in Plant—Murray at Helm

NEW YORK CITY, Feb. 10—Ten thousand trucks of 1¼ and 2¼ tons' capacity are planned for 1917 by the Bethlehem Motors Corp. in its new plant at Scranton, Pa. This plant is rapidly nearing completion and covers, with its three-story office building and power house, 130,000 sq. ft. The production building is 800 ft. long, the entire property occupying 20 acres of flat land on the main line of the Central Railroad of New Jersey.

Arthur T. Murray, of the Brady-Murray Motors Corp., a New York City car dealer, has organized the new concern and is its president. W. S. Stevenson, formerly of the old Mack Bros. company, is the director of sales, assisted by H. B. Hall. Martin E. Kern is secretary and treasurer. L. K. Gordon, who has been identified with truck designing and production for 10 years, will be chief engineer, and H. M. Gray will have charge of distribution in the eastern territory. S. R. Magaw is purchasing agent and R. Hoyt Moses factory manager.

CORTEX—NEW CLUTCH FACING

INDIANAPOLIS, Feb. 5—A new material for facing disk clutches is being manufactured by the Hide, Leather & Belting Co. It is a composition containing a quantity of cork and will be sold under the trade name of Cortex. For this material it is claimed that the coefficient of friction is higher than that for asbestos compounds, and that prolonged use does not cause glazing or make the material hard, and that there is no restriction in the supply of the materials. At the same time the cost is stated to be from one-half to one-third less than that of asbestos. The material is applied in exactly the same way as the ordinary rings for disk clutches, and the company is prepared to make facings interchangeable with asbestos facings for any dry-disk clutch.

INDIANA HOST TO DEALERS

MARION, IND., Feb. 3—At the annual banquet to dealers for the Indiana Truck Corp., held here to-day, fifteen dealers representing ten agencies were addressed by C. G. Barley, president of the concern. Mr. Barley's talk was along practical lines of truck operation. He pointed out the importance of the moving factory—of keeping the truck moving—stating that idle time in loading and unloading often stands in the way of great economies. He stated that business in Indiana trucks had quadrupled in the first three weeks of 1917 over a corresponding period of 1916.

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Huge Pneumatics Solve Truck Problem of Albany Hardware Store

Tire Economy, Higher Speed, Less Repairs

A SOLDIER is no better than his feet. Similarly a truck is no better than its tires. An infantryman with sore feet, regardless of how good his physique in other respects might be or how brave he is or how excellent his marksmanship, is useless on the skirmish line. A truck, regardless of its adaptability otherwise, the excellence of its mechanism or the skill of its driver, cannot hope to be efficient if its tires are unadapted to the pavements over which it must travel.

What is the best tire equipment? The answer depends upon the conditions to be met with. In some cases bad roads require that solids be used. In others it requires quite the reverse.

A change in tire equipment made possible the successful application of a 1½-tonner in the case of the Albany Hardware & Iron Co., where a previously-owned truck of the same capacity had gone to pieces within 2 years. The occasion for this is that Albany, N. Y., is poorly paved, as a rule; it is a city of steep hills and considerable distances for one of its size. The business section occupies a small area extending up the side of a steep ravine, at the bottom of which is the Hudson River and the docks and at the top the State house.

Why Pneumatics?

Because of the distances and the hills speed is essential. On the hills a truck loses time which it must make up when on the level in order to cover the great distances economically.

After disposing of its other 1½-tonner last April the Albany Hardware & Iron Co. purchased a 1½-ton worm-driven Mack, and instead of the standard solid tire equipment had it fitted with pneumatics, 37 by 5 in front and 38 by 7 in the rear. The intent was to increase the permissible speed of the truck, despite the bad streets, and to lessen vibration and consequent mechanical deterioration.

It was expected that the tire cost would be higher, but this was thought to be worth while in view of the superior service to be expected. More tire trouble, with frequent road trouble, was also anticipated.

Experiment Proves a Surprise

That the two main advantages expected have been realized is indicated by the fact that the vehicle, with rear wheels 2 inches larger in diameter, has no difficulty in making the hills with a gear-ratio increased from 7¾ to 1, to 7¼ to 1, and the governor opened up to give 24 miles per hour instead of the standard 16, with the full knowledge and guarantee of the International Motor Co., the manufacturer. The other expectation, that of mechanical well-being, has been amply justified, for barring a smash-up when the truck made an injudicious attempt to dispute the right of way with a street car, no repairs of consequence have been necessary.

But what was not expected was that the tire cost instead of being higher has proven to be actually lower. The original equipment on the rear was Goodyear. The right rear tire with the original air is still in place, and after over 5000 miles appears as in the illustration. The non-skid projections are still several hundred miles from being worn down, and there is still the body of the tire between this and the fabric to run on.



Goodyear 38 by 7 rear tire in excellent shape after 8000 miles on Albany streets

Big Tires Don't Puncture

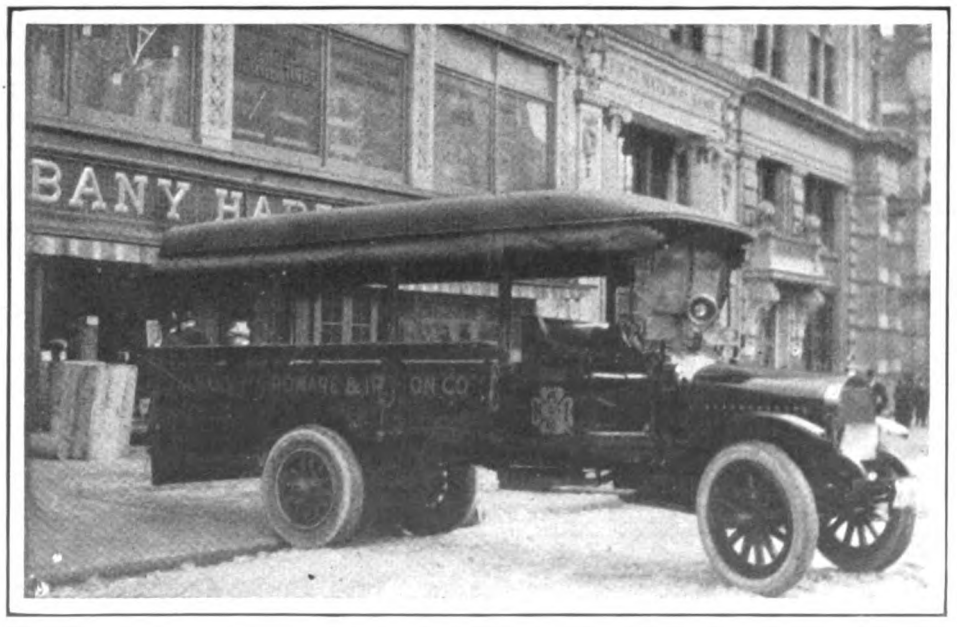
The left rear tire ran over a broken bottle concealed by snow and was so badly cut that it had to be removed and vulcanized. A Firestone was put on in its stead to give it a trial. The fronts are Quakers and last for about 4200 miles, a little low, considering that they are 5000-mile tires. The explanation is that they are slightly too small and will probably be replaced by the next size larger.

The Mack is used for deliveries of hardware and supplies in Albany's scattered residential section, and occasionally when an order exceeds $10 in value it makes country deliveries. It succeeds in doing about half of the total of city hardware delivery, both wholesale and retail. The other half is done by a Ford, used for special delivery work, as an emergency truck and to take the place of the Mack in the event of tire or mechanical trouble, and four one-horse delivery wagons, two of which are usually kept in the stable as a reserve.

Horses for Freight Work

The heavy hauling, consisting of the transfer of incoming and outgoing shipments between the railroad depots and the wharves and the delivery of iron and steel is done by three two-horse drays.

The concern operates the largest hard-



Mack 1½-tonner which, with large pneumatics has changed motor delivery from a nightmare to a dream for the Albany Hardware & Iron Co., Albany, N. Y.

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ware store in town, the wholesale end of the business being the larger. The Ford has been in use 2 years and has been the means of teaching the concern the evils of overloading and the importance, in a small fleet, of having a driver who is also a mechanic. Formerly men from the store were tried out as drivers, but repair bills came so thick and fast as a result that to-day on the Mack there are two drivers, both of whom are experienced chauffeurs, one of whom regularly drives and the other acts as a helper and takes the wheel in the event of sickness on the first driver's part.

At present the stabling accommodations of the concern are somewhat restricted, and so the trucks are kept in a public garage. Land has been acquired and a larger stable is to be built, so that in future the company will do its own garaging. This will be an advantage in this case, for the store has a motor accessory department and may be able to put the garage to good use in connection therewith.

Urges Combined Marine, Railroad and Highway Freight Terminals*

Co-operative Modernization Must Consider Trucks

By Calvin Tomkins

UNIFICATION of terminal facilities of various carriers by water, by rail and by road is urged by Mr. Tomkins, who, as former commissioner of docks of New York City and a constant student of terminal problems, is one of the greatest living authorities on freight terminal efficiency. The increasing congestion of our docks, railroad freight houses and highways, together with the increasing use of commercial vehicles over hauls of ever greater length and the inadequacy of the old facilities, laid out in the days before any one had any conception of modern traffic volumes, problems or development, renders a drastic change in terminal methods imperative at no distant date. Railroad costs are steadily increasing; their capitalization is steadily growing more excessive and governmental regulations constantly more stringent, so that it behooves every railroad, as well as steamship line, to give much-needed attention to that most neglected portion of their properties—the freight terminal.

BEFORE the days of the railroads all roads led to the docks and all vehicles could come alongside of ships to deliver or receive freight. The railroads are now the principal land carriers, and the problem of seaport organization is to re-establish former conditions by constructing public marginal freight railroads back of the docks, connecting them with each other, with all the roads leading to the port and with all the factory sites for miles back, so that all parts of the foreshore and backlands shall be made accessible to all carriers at a minimum expense for car transfers. In short, the terminal service of a port should constitute a single administrative unit for the common use of all carriers and all localities.

The rapid development of the motor truck, both gasoline and electric, will probably make the points of transfer between the highways, steamships and railroads of greater relative importance than has been the case in recent years. It is probable that for railroad short hauls there will be substituted motor truck transportation within the cities and for a considerable distance about them. Even now motor truck haulage between Philadelphia and New York has been undertaken, and when it is remembered that the terminal charges, including delivery and distribution, to and from railroad terminals, aggregates many times the cost of hauling the cars, it is evident that direct motor truck service between points of origin and destination will take the place of the service now rendered by the railroads to a large extent.

The late James J. Hill repeatedly stated that the railroad service of the country was breaking down at its city terminals. These terminals are expensive to enlarge on account of land values, and the difficulty of changing the city plan. At each city the railroads are also engaged in terminal rivalry, some roads having much better facilities than others. The terminals are business getters for the roads. Modern terminal administration involves the articulation of separate railroad and water terminals as administrative units, and it is naturally against the policy of the roads which have developed at much expense superior terminals, to acquiesce in a policy which contemplates parity of opportunity for all.

Neither the railroad nor the water terminals of the port will be properly organized until they are connected with each other and with factories and warehouses so that every locality, every shipper and every carrier can be brought into relation with all others at a minimum switching cost. This end has been attained at New Orleans, Montreal and San Francisco and most of the North seaports. Other ports of the United States, with the exception of New York City, are making rapid advances in this direction. The expenses, due to delays incident to bad terminal organization, are very heavy and tend to keep motor trucks from replacing horses in many cities.

Improved terminals must be financed out of the savings effected by the improvements, and in order to avail of this revenue it will be necessary to separate terminal charges from transportation charges on the railroads. As a rule, this is not done at present; terminal costs are absorbed in freight rates and are disproportionately charged in short hauls. Railroad freight rates are based on the older conditions when haulage was the principal factor and do not take sufficiently into consideration the terminal costs which should be segregated in the service charge made by the railroads.

Backward seaports and great railroad terminal centers can only hope to modernize their equipment by segregation of this description, and by utilizing the terminal profits to pay the interest on the cost of terminal improvements. One result of development in this direction will be the substitution of public for private railroad and steamship terminals, since in addition to the other burdens which terminals must assume, the private terminal is heavily taxed, and when steamship and railroad competition at terminals ceases as a consequence of better organization, there will not be the present inducement to maintain private terminals.

Francis Lee Stuart, chief engineer of the Baltimore & Ohio Railroad, recently stated that he would "be surprised if it was not found that at least 30 per cent. of the capital of the trunk lines is invested in terminals in cities having water transportation, and possibly 50 per cent or more of their capital in what may properly be termed 'Terminals of all kinds in all cities.'" He adds that "the problem of reorganization is not in building piers or belt lines, or the money involved, but it is to find a policy to carry out such plans which will not reduce the value of the millions which private and corporate interests have taken in business risks in developing the growth of the city in the past or, in other words, punish them for having been a factor in such growth.

"It is not likely that the waterway system of the country will be greatly developed until a policy of pro-rating between the waterways and the railroads shall have been adopted. Waterways by themselves are of comparatively small value since the railroad goes everywhere and the waterway only makes communication possible between a few points."

The growing use of motor trucks will add to the usefulness of the waterways if the necessary terminals shall be provided.

The principal difficulty at present experienced in changing from the old system of separate competitive terminals to the modern system by administrative terminal unity at each city is interference with vested interests. The present terminal system has gathered around it an immense private interest, dependent upon its continuance, and a very considerable part of the investment so made must necessarily be scrapped in the process of modernizing terminals. Nevertheless, force of circumstances is rapidly compelling the change to be made at all cities in spite of bitter opposition. TRANSPORTATION, NOT COMPETITION, IS THE LIFE OF TRADE.

*Read before Section D, Engineering, American Assn. for the Advancement of Science, December 22, 1916.

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Other Sources of Fuel Supply

Casing-head Gas, Shale and Red Clay Practical Alternatives to Petroleum

By J. Crow Taylor

OTHER sources of gasoline than the well-known sources of the oil wells of the country have not yet been so very extensively developed, but it is a fact that there are other promising sources of gasoline. Two of them have been mentioned incidentally by reports of the U. S. Geological Survey during the present year.

Usually when gasoline goes high in price and some apprehension is created as to the future both the lay mind and the scientific mind generally turn toward the sources of substitute materials for gasoline, that is toward alcohol and the chemical offerings of the internal combustion class other than gasoline proper. While these are interesting they are not a part of what is in mind right now or of what is to be discussed in the present instance. It is the other sources of gasoline itself that furnish the motive for the present study.

One of the recent bulletins of the U. S. Geological Survey says that statistics just completed under the supervision of J. D. Northrop of the Survey shows that in 1915 there was considerable activity in the production of casing-head gasoline, that is of extracting gasoline from natural gas. The total amount of gasoline extracted and sold from natural gas during 1915 was 65,364,665 gal., a gain of more than 50 per cent as compared to 1914.

Promise in Shale Oil

This shows one of the other sources for gasoline and indicates that considerable development is being made. Another source which we may regard more as a matter of future reserve than present development, but none the less interesting for all that, was told of in a bulletin of the U. S. Geological Survey last March. This is the production of oil and gas by distilling shale, and the Survey informs us that an almost inexhaustible supply of oil gasoline and ammonia can be obtained from the shale of northwestern Colorado, northeastern Utah and southwestern Wyoming.

The study of the possibility of oil from shale while not a matter of so much immediate importance as the development of gasoline from natural gas is really much more interesting because it suggests almost undreamed-of possibilities in the future. When any mineral product becomes scarce and high in price our Geological Survey sets its experts to work studying the subject and developing ideas as to possibilities of other sources of supply. So when gasoline went high in price early this year the interest of the Survey was turned to some of our undeveloped possibilities.

Experiments show that oil derived from distilling these shales is similar to that which is produced from oil wells in the United States and at the rate of more than 250,000,000 barrels a year. When refined by the ordinary methods the shale oil yields an average of 10 per cent gasoline, 35 per cent of kerosene and a large amount of paraffin wax. It is thought that the yield of gasoline from shale may be increased by the use of refining methods especially designed for that purpose. The gas obtained is a very good illuminating gas which it is thought will furnish all the heat required in the process of distilling. Another product obtained in the process of distilling is ammonia, which it is thought may be used in the manufacture of fertilizer. Estimates based upon experiments are that a ton of shale will yield 10 gal. of gasoline in addition to the other products.

Of course, at the present time development of this source for gasoline is commercially impracticable because of the cost of distillation and transportation. However, it is known that for 50 years the oil shale industry of Scotland has been an important one, employing quite a number of men, and yet the yield of oil per ton of shale in Scotland is much less than the yield indicated in the shale of this country by experiments. So, while there is not much likelihood of these shales being developed immediately they constitute a reserve source of much interest that may become of great importance in a later day.

A Ceramic By-product

An item coming over from England during the summer that touches somewhat upon the same matter tells of a brick earth or clay over there which when distilled at a red heat gives off 500 cu. ft. of gas per ton, 6 gal. of crude oil and 25 gal. of ammoniacal liquor, and the idea is suggested by this of possibilities of future distillation of clay gases, perhaps in connection with the brick making and clay working industries, by the obtaining of such products as by-products in clay working.

And now to return to that other source of gasoline which is being actively developed at the present time, the production of gasoline from natural gas. We find by the Government figures that during 1915 24,000,000,000 cu. ft. of natural gas was used in the recovery of gasoline and the number of plants operating increased from 386 at the beginning of last year to 414 at the end of the year, a development that has apparently kept up right through the present year.

The greatest production for this source has been in the West, Oklahoma leading with a production of 31,665,991 gal. of gasoline, followed by California with a total of 12,835,126 gal. Then comes West Virginia with nearly 11,000,000 gal., Pennsylvania with nearly 8,000,000, Ohio with over 2,000,000 and Illinois better than 1,000,000.

Gasoline from Natural Gas

Oklahoma started its big development back in 1914, increasing its production of gasoline from this source 167 per cent during that year, much of the production seemingly being from gas wells that had gone weak in pressure from which the gas was obtained and condensed by pumping.

The first specific attention given to tabulating the production of gasoline from natural gas by the U. S. Geological Survey was in the annual report of Mineral Resources for 1911. According to this report there had been enough active development going on for the 3 years previous to justify the giving of this source of gasoline consideration in a place by itself. The investigations made for the report of that year on the subject showed that while some gas contains very little if any gasoline, other gases contain it as high as 8 or 10 gal. per 1000 cu. ft.

Two processes of extraction were taken note of, one of compressing and cooling and the other of distilling by making air tight connections with gas pumps to the casing of wells and distilling the gasoline of the oil in the sand below by producing a strong vacuum with the pumps.

It is said that this pump idea had been used in a limited way in the vicinity of Tidioute, Pa., for 40 years, but the gasoline was not sold or exploited until about 1899. Since 1910 it is said that the producers at that place have manufactured gas successfully and this perhaps marks the beginning of the history of obtaining gasoline from natural gas in this country.

The industry did not prosper in 1911

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as was hoped because gasoline was very cheap at that time and the price obtained was not such as would lend encouragement to extensive development. It was felt, however, that here was a reserve source of gasoline that might become of great economic importance in the future, especially since generally the gas itself could be used after the gasoline is extracted so that the gasoline itself became a by-product or an additional production from the gas wells.

In 1912 gasoline advanced some in price and this encouraged more activity in development and led to a more extensive study of the possibilities of gasoline from natural gas. It was found upon examination that all gases are not adapted to the manufacture of gasoline.

Can't Use All Gases

Some are dry and contain little if any gasoline. Other or wet gases do not always contain sufficient to make it profitable. It was found that a chemical analysis would tell what yield might be expected, but the installation of a small experimental plant was considered a better test and considerable attention was given to experimenting. Since that time there has been fairly steady development in the production of gasoline from natural gas, with an average production range from 1.32 to 3.60 gal. per 1,000,000 cu. ft. of gas.

Oklahoma Gas Rich

Oklahoma seems to have gas wells that run especially high in gasoline, which is perhaps one reason why the development there has been so extensive, especially among what is termed the declining wells.

From a total production of gasoline from gas in 1911 of 7,425,839 gal. to 65,364,666 in 1915 is a fairly good record of progress and should be an attest of the future possibilities of gasoline from this source, especially if the price continues high enough to lend zest to further development.

Shale and Clay Future Reliance

When we may find it necessary or advisable to undertake the distillation of gasoline from shales and clays it is impossible to say. But the fact that there are possibilities there in the way of reserve sources should keep our scientific interest alive and justify experiments and research work as a sort of preparedness for future needs.

Also, it should be a matter of some satisfaction to the multitude of gasoline users throughout the country that in addition to the possibilities of development among what may be termed the substitutes for gasoline there are also other sources of gasoline of the type now generally used that will interest and may help the situation out considerably in the future.

Makes Six-Wheeled Ford Truck

Body Is Long But Truck Turns in Normal Radius

Six-wheeled and made exclusively of Ford parts, the vehicle shown in the accompanying illustration employs the unusual construction of mounting the body flexibly on the frame at two points instead of attaching it rigidly along its length. The vehicle has a rated carrying capacity of 1500 lb., is called the Arnold Autoport and is made by the Arnold Autoport Co., Paterson, N. J.

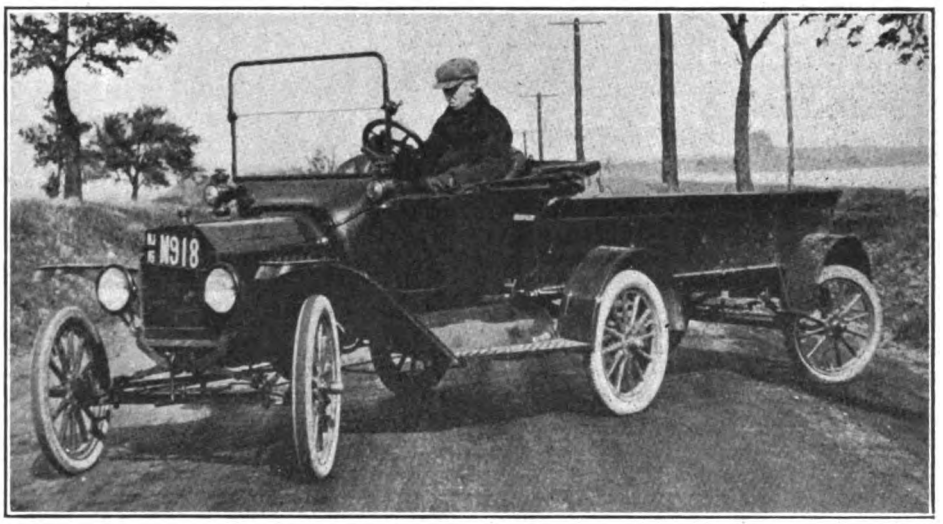
While originally designed for use in connection with Ford chassis, the same method of construction may be applied on other makes of passenger cars to be used for light delivery work or as buses in rural territory.

As offered by the Arnold company, the vehicle consists of a Ford chassis to the rear of which is connected a two-wheeled trailer made up of the front end of a second Ford frame, front axle, crosswise spring and wheels, the latter forming the rearmost wheels of the completed vehicle. This frame is pivoted to the rear end of the conventional chassis frame at two points on a crosswise bar.

Wooden Reaches Used

The two-wheeled rear unit is also connected with the rear end of the chassis by means of a rectangular wood frame pivoted at its front to two straps around the live axle housing, one near each wheel.

The body is pivoted to two cross bars on the metal Ford frames, each bar being midway between the center wheels and those at the front and rear, thus tending to distribute the load equally over each of the six wheels.



Arnold Autoport, made of a Ford with two frames and two front axles, one in back, showing short turn

Reverse Rear Steering

The steering arms of the front and rear sets of wheels are connected by longitudinal cables attached to pivoted triangular-shaped equalizers at each end. By this means the front and rear wheels turn at opposite angles and run in the same track in rounding corners, thus giving a short turning radius.

This short turning radius is one of the advantages of the vehicle, the others being the reduction of tire wear and ease of riding, by carrying the load on six wheels instead of four and the unusual manner of carrying the body so that any set of wheels may pass over small road obstructions without elevating the body to a corresponding height.

For example: As the front wheels mount stones or ridges in the road, the body bottom is some distance above the frame over the center pair of driving wheels, as is also the case when the rear wheels are elevated. When the center pair of wheels is passing over an obstruction, the rear end of the body extends clear of the rear pair of wheels and supports its load aft of the rearmost pivot point by its own inherent strength.

Seat Should Be Rigid

This construction offers a certain degree of flexibility, but would seem to make it necessary for the driver to exhibit extreme care in that his seat is carried at the front end of the body and continually swings about the forward body pivot as any pair of wheels mounts obstructions in the road.

When used as a bus, the body is usually fitted with five crosswise seats, including that for the driver. With two passengers to a seat the capacity is ten.

Everyone knows about the use of a magnet to extract small parts, nuts, screws and the like from inaccessible places into which they have been accidentally dropped. This only applies to iron parts, however. If of brass, a piece of cloth padding the end of a stick and covered with rubber cement will serve.

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THE BOTTOM OF THE GORGE WAS SMOOTHED OUT, BUT IT PRESENTED A FLOOR OF RUBBLE AND SMALL ROCK WITH NO SOIL OR DIRT TO FILL IN

MOTOR transportation seems not to have been thought of by nature when she secreted some of her richest mineral deposits in the most inaccessible places. It is a far cry from the discovery of the pay streak by the nimble prospector and his doughty burro to the practical mining, transportation and sale of the ore. Many are the cases in which veins of great value have been allowed to lie unworked, although well known; to be offered for sale at prices representing but a shade of their value—with no takers; to be worked a short while only to be abandoned with fabulous riches apparently in plain sight, all because nature had erected such barriers to transportation that it paid no one to bother with the project. The modern motor truck, tractor and caterpillar are changing all this. Nature will have to erect mightier cliffs, dig deeper gorges and spread broader deserts to stay the hand of marauding man.

Metal Shortage Boosts Trucks

The metal goods manufacturer who cannot get deliveries of material guaranteed for contracts in the latter part of 1917 and early 1918 is unwittingly the star salesman of motor trucks for mine hauling work. In the mountainous Western mining country there has always been more mineral than transportation. It takes both to make a working mine and, whereas a liberal government has offered to the prospector inducements of free mineral claims, transportation has always been a high priced commodity. Furthermore, the canyons of the West are of an antiquated design, as referred to the achievements of the engineer who designs modern heavy mining machinery.

Circumventing Nature's Strategy

These canyons were laid out by Nature with reference to the turning radius of a single mule. Heavy mining machinery requires many mules for hauling the big pieces up stiff grades, through deep sand. Even when a fairly-graded road is built, heavy machinery cannot be hauled in because a string of mules big enough to pull the load on a straightaway gets wound up on the hairpin turns in the hills. The total tractive effort of a 20-mule team cannot be applied.

The motor truck has gone into this mining country and made good. The truck hauling has been pioneered by indomitable hauling contractors, who have entered the field in the spirit of selecting the hardest tasks, which bring the highest rewards, and putting them through in defiance of obstacles.

Some months ago M. George Wadey of Good Springs, Nev., a garage owner, thought he was neglecting opportunities in not doing some of this mountain hauling. So he bought himself a Jeffery Quad 2-ton truck and set up a side-line business as a hauling contractor. Some of the work was close to town and a lot of it was easy. The biggest thing Mr. Wadey tackled in the town was moving a four-room house on his truck and he got away with it nicely.

There is just one Devil's Canyon in each section of bad mountain country in the West. The Devil's Canyon near Good Springs has a mine near its upper end, as many Devil's Canyons do. War prices for metals were a tremendous temptation to develop the output, and this meant machinery. The machinery would not be much good unless it had a pair of fly wheels for the mill engine that were fairly sizable pieces of fabricated iron weighing about 4 tons.

Outwitting Mother Earth

Devil's Canyon looked as if it was just about able to keep the Christmas Consolidated Mining Co. from having any mill. Then Wadey tackled it. The Good Springs *Gazette*, published at Good Springs, Clark County, Nevada, is a lively paper that keeps close track of the doings at the mines in its locality. The Christmas Consolidated mill installation was an event important enough to get in the feature position on the front page. It is a most interesting story, one-third about the mill and two-thirds about the conquest of Devil's Canyon by the Jeffery truck. It says:

"Achieved the Impossible.

"Concentration Mill in Devil's Canyon an Accomplished Fact.

"Only one who is familiar with this canyon can realize the stupendous obstacles that have been surmounted in transporting this mill with its heavy machinery through the twists and turns of this defile. Many years ago, before Doran & Zenzen invaded this country, with nothing but grit, strength and determination as capital, Devil's Can-

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yon was nothing but a great break in the massive limestone formation with sheer walls rising hundreds of feet above the bottom of the gorge to the skyline.

The Dynamite Route

"In places it was less than 10 feet wide, with abrupt descents over ledges of limestone fully 20 feet of a drop before the explorer could reach a lower level by climbing to the rock and dropping to the sump of sand at the bottom of the ledge, which was thick enough to break the force of the fall. These ledges have been blasted away until a grade has been obtained, and parts of the walls where they have jutted out over the roadway were blasted out.

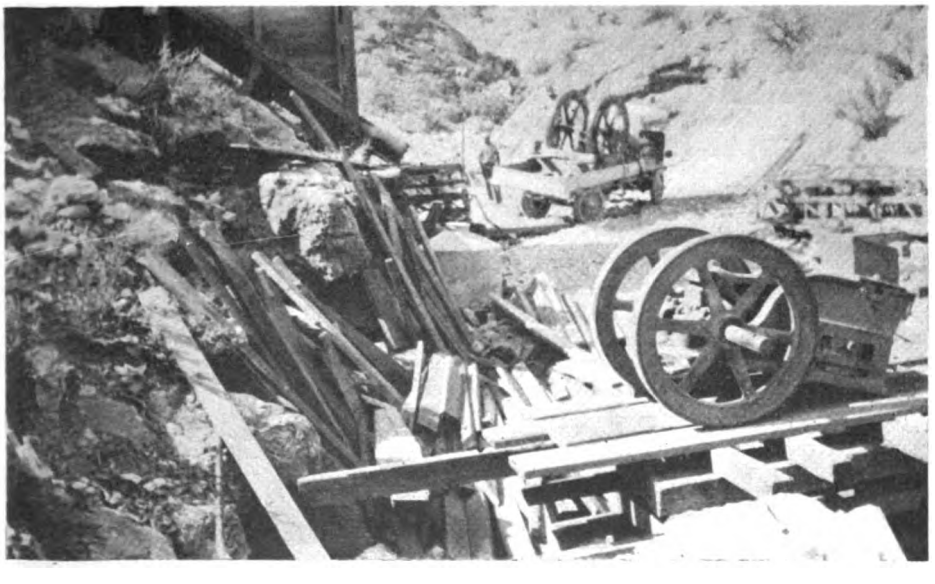
"The bottom of the gorge was smoothed out, but it presented a floor of rubble and small rock, with no soil or dirt to fill in the interstices. This had to be hauled from the valley below or dumped down from the rim of the Canyon above. The sharp, steep turns had to be planked so that a tractor or team could get a permanent traction or foothold, as the power exerted on the shifting rock was so great that no progress could be made.

"In hauling the heavy parts of the machinery through the canyon, it was found impossible to use teams. If it were on a straight road a ten- or twelve-animal team would be able to turn the trick, but the many turns in the canyon curtailed their pulling power, making their efforts futile.

"A transcontinental railroad can pull over a 2-per-cent grade, a cog-wheel locomotive will essay as high as an 8-per-cent grade, but the grade in Devil's Canyon has an average of 20 per cent, and the only power that was found available to pull over this steep incline was found to be a motor truck with driving power exerted on all four of its wheels, and it was one of these trucks that conveyed the heavy machinery up the grade to the millsite at the foot of the main tunnel on the Christmas."



THE MACHINERY WAS NOT MUCH GOOD UNLESS IT HAD A PAIR OF FLYWHEELS FOR THE MILL ENGINE. THEY WERE FAIRLY SIZEABLE PIECES OF FABRICATED IRON WEIGHING ABOUT 4 TONS



IN PLACES IT WAS LESS THAN 10 FEET WIDE WITH ABRUPT DESCENTS OVER LEDGES OF LIMESTONE FULLY 20 FEET OF A DROP

Empire State May Revise High Truck Tax

(*Continued from page* 11)

trucks under the flat $5 fee per year, as in 1916, and the proposed fees according to the Hewitt-Wells bill if the local and general taxes are removed. For example, a conventional 1-ton truck costing approximately $1,650, including an ordinary body, in 1916 had to pay a registration fee of $5 plus about 2 per cent of the valuation in local and general taxation, which amounted to $33, giving a total of $38. With the present fees as scheduled and ratified by the Hewitt-Wells bills, the registration fee for the same truck weighing between 2 and 3 tons would amount to $15. This shows an actual saving to the owner of $23, provided the local and general taxes are eliminated. This saving will be proportionately increased as the size and value of the truck is increased for the reason that the registration fees do not increase in the same ratio.

In addition to the bills already mentioned, Senator Murphy also introduced a measure in the Senate to repeal the Hewitt-Wells bill, but there is little possibility of this being done. As a result, truck owners will have to pay the increased fees for 1917 unless the new commission to be appointed by Governor Whitman should make its decision before the close of the year and its recommendations be enacted into law before that time.

Even then it would require court action in the nature of a test case in order to have any of the fees paid at the 1917 rates returned. Any returns of this nature by the State could only be made if the individual truck owner paid his fees under a protest such as printed in the last issue of THE COMMERCIAL VEHICLE. For this reason it is highly important that all truck owners in New York State should pay their fees under protest, so that they will be in a position to demand a return of a portion of the tax should the new commission recommend a smaller fee than that paid.

Senator Brown, who opposed the fight of the truck owners at the hearing held in Albany on Jan. 24, was also present at the meeting before the Governor on February 6, and after listening to the arguments presented by those present stated that he was willing to aid in the formation of a new commission, but that the owners would have to abide by the findings of the new commission, even if the rates recommended should be greater than those at present provided in the Hewitt-Wells bills.

Several of the truck owners present countered by stating that they would rather pay for the upkeep of good roads than for an excessive amount of repairs dute to poor roads. It was also brought out that truck owners do not want roads built in the scenic sections of the State for purely tourist travel, but better and wider roads in the industrial sections adjacent to cities where the great bulk of the trucks in the State are employed.

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Motor Truck Circus Organized Along Military Lines

New and Interesting Vehicles Developed

REVOLUTIONIZING an industry 2693 years old by the most forward stride so far made is a big enough thing to do to merit more than passing attention. The circus business started, as far as existing records show, in 776 B. C., and ever since has been conducted along fundamentally the same lines; that is, transporting itself principally by its own animals. True, in the last 50 years it has been customary to use the railroads for the long jumps; but these only serve for a portion of the transportation and do not decrease the number of draft animals needed. Frank P. Spellman and the United States Circus Corp., as related on page 16 of the Jan. 15 issue of this magazine, has made the forward stride, doing away, at one bold stroke, with both animals and railroads as transportation means.

The idea of a completely motorized circus came to Mr. Spellman about 3 years ago. At that time he was running a twenty-four-car outfit by the old plan. At a small place called Burton he had the misfortune to have one of his heavy wagons so mired in the mud of the field in which the circus had played the night previous that twenty-four horses and two elephants could not extricate it.

While the struggle was in progress a Bell telephone truck happened by. This was a large gasoline vehicle, used in the erection and repair of telephone lines, etc. After watching the fruitless efforts of the circus men for a time the driver offered to lend assistance. He attached a chain to the wagon, let in his clutch and by the power of the truck alone pulled the wagon out sideways. That is how Mr. Spellman says he first thought of a motor circus. The man was paid $50 for his work and spent the rest of the morning helping the circus off the badly-bogged grounds.

Bostock Animals Purchased

Constant development of his idea in the interim has resulted in the formation of a highly-organized plan, A. Roy Knabenshue, the pioneer American aviator, being retained as the engineer of the venture. Mr. Knabenshue has developed the mechanical end of the business while Spellman was organizing a $1,000,000 company, with himself as president and general manager, engaging performers and crews and purchasing equipment and animals. He has secured, at a cost of $150,000, the Frank C. Bostock collection of trained animals, some of which are in London, others in southern California, being used in motion picture work, and others at Coney Island and Luna Park.

The show is to open probably at Newark, N. J., on May 14, and will go from thence through New England, back across up-State New York, Pennsylvania, Ohio and the Middle West, circling back again later in the season. The corporation has been organized a year and is fully capitalized, its stockholders being located all over the territory which is to be played.

Although this article must be devoted particularly to the transportation elements of the project, it may be interesting to state that the whole policy of the concern is one of co-operation, rather than exploitation. The circus is to be a motor show throughout, special motor events being scheduled in the performances and motor curiosities in the sideshows, perhaps. The parade is to be a traveling motor car show, representative cars of all makes being included in it. Manufacturers of whom the equipment is bought are to co-operate in the publicity for the exhibition, having their own feature vehicles with the convoy and in the parade.

Many Unique Floats

The Kelly-Springfield Motor Truck Co., which supplied the 100 3½-ton chassis, is to send along a 3½-ton chassis equipped with a club car body which will represent the name of its house-organ, *Like Kelly Does*. The Firestone Tire & Rubber Co., whose tires will be used exclusively, will have a float called The Colossus of Roads, which will feature the Firestone Giant tires to be used on all of the trucks.

Another co-operative feature will be the slogan of the circus: Good Roads. Highway commissioners all along the way will be invited to visit and accompany the circus along the way.

A number of exceptionally beautiful floats for the parade are in course of construction in the plant of Bode Bros., Cincinnati, a small number of the Kelly-Springfield chassis having already been delivered, the rest to be turned out as fast as the body builder can accommodate them. Some surprises are planned, details of which are carefully-guarded secrets; but it is known that some unique appliances are to make their appearance.

One of these is the Kelly Snake, a new type of caterpillar tractor, much smaller than the farm type and partaking somewhat of the nature of a commercial tractor, which will serve to pull any of the vehicles out of whatever mire they may encounter. There will be a stake-driver, which will work automatically.

Stake-Driver a Whirlwind

Formerly it took a crew of seventy men 3 hours to drive the tent stakes for a show the size of this one. Two little machines, each with one man and a colored boy, will drive 355 stakes in one hour, without human labor other than the inserting of the stakes in the driving member by the boy.

There will also be a stake puller, which will have a crane attachment by which even the most stubborn stakes will be pulled quickly and easily This little vehicle will work more quickly and with less human effort, even, than the stake driver, and will only have an 86-in. wheelbase.

The handling of the canvas is the biggest job in the circus, just as it is in the quartermaster work of an army encampment. To avoid the expensive and difficult lifting of the canvas, especially the acres of fabric represented by the Big Top, reels mounted on trailers will be used, by which the great sheets will be wound up or unwound like window shades by mechanical power.

Learning from Uncle Sam

Although it is only little more than 6 weeks ago that the first news of this venture was permitted to be published, there has been widespread discussion of it, and grave doubts have been expressed of the ability of the show to negotiate country roads and especially to get on and off the lots. It was not for nothing, however, that Mr. Knabenshue spent weeks of time on the Mexican border studying the methods of the United States army in using its 2300 trucks and planning improvements and adaptations to the circus business.

Since time immemorial circus transportation has been recognized as one of the most exacting tasks, and as a result it has developed of recent decades into a system of exceedingly high efficiency, so much so, in fact, that old circus transportation men have been secured by armies to conduct quartermaster work.

It was related by one old circus man that when he was attending to the transportation of the late Buffalo Bill's show in Germany, responsible officials of the German army watched his operations with minute care for days. Some of the managers of highly-organized commercial truck fleets are graduates of circus experience.

But this efficiency has always been seriously hampered by the impossibility of making the railroads conform to the needs of the circus. The best-laid plans have gone sadly awry because certain trains were unavoidably prevented from making the proper connections, etc. In the United States Circus Corp.'s plan, however, the reliance will be placed solely in one organization which, laid out

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on military lines and employing discipline scarcely less strict than in an army, will be able to carry out its plans without a hitch.

To insure against road delays, the advance men will also all be road scouts. Forty days in advance the first car, a passenger vehicle, will carry two men, who will make definite arrangements in the various towns along the route for a lot, permits, etc. They will also lay out a preliminary route, subject to change.

Thirty days in advance the main advance advertising crew will arrive, consisting of twelve men, three trucks and one passenger car. This crew will give a more complete report.

Twenty days in advance a second bill-posting crew of six will arrive and send back reports.

Fourteen days in advance the main bill-posting outfit, consisting of twenty-four men, will arrive, posting bills in a radius of 60 miles, and reporting as to all of the roads in the vicinity.

Four days ahead of the circus will ride four road scouts, on motorcycles, who will check up on the information already received and send back final reports of any work to be done in order to make the roads passable.

The Kelly Snake

One day ahead will be the road engineering outfit, with twenty men and two foremen. It will be equipped with four trucks and the Kelly Snake. One of the trucks will have a crane. Every known device for quick road repairs, even including strengthening of bridges, building of culverts and laying of pontoon bridges across streams, will be carried. With this preparation of the road and the secret means which have been developed to render it possible to get the trucks into and out of the lots, it is thought that the circus will be able to proceed without apprehension.

Besides all of these precautions, the route will not be laid out until the path-finding car, which has been on the road for some time, shall have returned and rendered a minute report.

The hazard of importance next to the roads is the mechanical condition of the trucks. As in an army, the trucks will have to keep up with the circus or drop behind, for the circus will wait for no one. If a breakdown occurs it is quite as likely to happen 20 miles from nowhere as in a town. Accordingly a complete wrecking outfit will be carried, in which there will be a machine shop truck similar to those used by the army in Mexico, in charge of expert factory mechanics.

Military Organization

The train itself will be divided into two parts, the first a utilitarian unit and the second the parade convoy. These in turn will be separated into divisions of ten trucks each, or a total of ten divisions. Seventy-six Troy trailers will be hauled behind the trucks in the main body.

Each division will be commanded solely by a superintendent who will ride a motorcycle and will have full responsibility for the ten trucks, their trailers, loads and personnel. The manager of transportation will give his orders for movement by units to the superintendent of each. For the superintendent and for road scouts a fleet of Indian motorcycles has been ordered.

Divisions of Ten Trucks

While on the road each division will operate independently according to its own orders, the trucks keeping a uniform distance of 15, 20 or 25 feet apart, as ordered. The superintendent, being on a motorcycle, will be able to ride up and down the line and see that this proper distance is kept, and will be able to ride back or ahead to the wrecking crew in the event of an accident to any truck of his division.

The trucks will all be governed to 10 miles per hour, and will be manned by experienced drivers who have passed a searching examination. They will work 8 hours a day and receive $3 a day pay, 7 days a week, being boarded by the circus and sleeping on their seats. They will be required to do nothing but drive and care for their trucks.

So attractive, indeed, is the job of driving one of the 100 trucks that the concern has been deluged with applications from 250 college men from a score of Eastern universities, from employees in the plants of the concerns from whom vehicles and supplies are being bought and from individuals.

Each truck has a cab quite separate from the rest of the body, regardless of what its type may be. This cab has a seat over 6 feet wide with a lazy-back, which folds down to form a comfortable bed for a tired man. Lockers are provided for the driver's personal effects, and his cab is his home for the term of his employment.

Equilibrists and Elephants Share Trailers

The rest of the employees will sleep in special sleeping bodies mounted on trailers. For the officers and performers there will be Pullman car bodies. For the hands bunk cars.

Others of the trailers will carry cages and stalls for the horses. Six horses will be carried to a trailer, four camels, two small elephants and one large pachyderm.

A circus day, since time immemorial, has started with the morning parade at 10 or 11 o'clock, and ends with a grand pageant in the Big Top at the end of the performance shortly before midnight. In the interim the tired members of the outfit must get in 8 hours of sleep and move to the next town.

This circus will make jumps averaging about 35 miles, and with none of greater distance than 50 miles, excepting over Sunday. Furthermore, not content with the usual 11 o'clock parade, Mr. Spellman is determined to make the entire jaunt from town to town a parade, and by proper advertising to see to it that the entire populace along the route is lined up at the fences to dignify his passage.

A truck running in open country will average nearly its maximum governed speed, so that it is expected that the jumps will never take longer than 5 hours except possibly over Sunday. This will permit as late a start as 5 a.m., arriving in the next town in time for the parade to start between 10:30 and 11.

This will permit the performers to use as much of 10 hours as they wish for sleep, the last 5 of which may be taken *en route*. In the event that an earlier start is thought wise, it can be made.

Every member of the company will eat his last meal at 5 p.m. each day. By 5:30 the culinary division will be on the road and starting for the next town, picking up the needed supplies by the way. It will arrive at the site of the next camp between 10 and 11 p.m., so that its crew may have a good rest before it is necessary to get breakfast for the earliest of the other divisions.

A Day with the Circus

Between that time and 8:30 the whole circus will be going full blast. By 9, however, the public will have abandoned the side-shows and everyone will be in the Big Top. Then the side-shows will be packed up, their tents struck and the side-show division will take to the road.

When the show in the Big Top starts everyone will have left the menagerie and will be in his seat. These tents will then be struck and loaded and the menagerie division, consisting mostly of cages, will be on its way.

As each act finishes its turn its traps, equipment, costumes and animals will be packed away and loaded, so that when the grand *finale* is over the equipment used in it, the Big Top itself and the seating will be all that is left to load. The audience on leaving the grounds will find the circus leaving with it—nay, having mostly left long ago. By 12, midnight, the entire circus will have quit the town and the lot will be vacant.

These last divisions will reach the next lot somewhere between 3 a.m. and 5 a.m., if it leaves at once, or it may stay on the old lot or at the roadside until then and make the run into the new town by daylight.

Parade en Route

Which method will be used is not yet decided, but the daylight method is preferred. Contrasted with the railroad method of transportation, especially in this day of freight congestion, when many a morning parade has to be abandoned because it is 2 or 3 in the afternoon before the circus trains arrive, the great advantage in the use of the motor truck is readily apparent.

Where longer jumps than 50 miles are to be made the schedules will be arranged so that these are made over Sunday, so that 100, 150 or even 200 miles might be travelled, with the advantage of perpetual interest and advertising along the way during Sunday.

The daily parade will be made up at the new grounds each day, the daylight ride being in addition to this. The circus will have six bands, one of which will be composed of ladies.

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Better Merchandising Plans Discussed By U. S. Chamber of Commerce

Daylight Saving and Webb Bill Approved—Need for Uniform Bills of Lading and Greater Governmental Help Shown

WASHINGTON, D. C., Feb. 2—The adoption of a daylight-saving plan in this country; the approval of the Webb bill legalizing combinations in trade to undertake foreign business; the need for uniform bills of lading to simplify shipping; greater business efficiency in both the home and foreign markets, and greater co-operation between our government and our manufacturers, were the spotlights of the 3-day convention of the Chamber of Commerce of the United States which closed here to-day.

All of these topics are of vital importance to both truck makers and truck users for the reason that conditions which affect the country at large generally sooner or later affect every member of it, be he a truck maker or truck user. Good business conditions enable business concerns to afford the more expensive motor vehicular equipment to replace the inefficient animal transportation.

There were 1282 delegates and guests in attendance at the meeting, as compared with approximately 960 last year. Most of the sessions were held in the auditorium of the New Willard Hotel, but this afternoon's meeting was in the building of Pan-American Union.

Coffin Talks on National Defense

Howard E. Coffin of the Naval Consulting Board, addressing the chamber on the subject of national defense, said the real facts about the military unpreparedness of the United States would prove startling, and in this connection he submitted some figures which he asked should neither be recorded or published. Mr. Coffin, discussing peace plans for war, said in part:

"The motor-vehicle industry is the best organized industry in the country. After a declaration of war no more than 15 per cent of the industry would keep on with its regular work. All other industries would be affected in about the same proportion. Close observation of the experience in foreign countries has shown us the vital necessity for a prearrangement in all industries.

"Wars as now waged involve every resource of a nation. Every factory, every man, woman and child is affected. Every sinew of transportation, industry and finance must be harnessed for the common good. It is upon organized industry in the United States that we must base any and all our plans for a military defense and in the event of trouble with any of the first-class powers, between 80 and 90 per cent of our industries would be centered upon making supplies for the government. From 1 to 2 years of time and effort are needed to permit any large manufacturing establishment to change over from its usual commercial peace-time work to the supplying of war materials. After 2 years of diligent work over 20,000 inventories are now on file in the Council of National Defense."

The Need for Daylight Saving

The committee on daylight saving of the Chamber of Commerce of the United States recommended that Congress enact legislation providing for moving the clock ahead 1 hr. on April 1 each year and, if necessary, turning it back on Nov. 30.

It was pointed out that our business hours are out of keeping with the hours of daylight, especially in summer, and that it was wasteful to sleep through hours of sunlight in the morning and then burn artificial light for several hours in the evening. These habits are probably the result of improved illuminants and changing industrial conditions.

Chicago Conditions Cited

As an example of present conditions, the situation at Chicago was cited. Throughout the year at Chicago the time between sunrise and noon is longer than that between 1 p. m., when the second work period begins, and sunset. In December there are almost 5 hr. of sunlight before noon and less than 3½ hr. after 1 p. m. In June there are approximately 8 hr. before noon and about 6½ after 1 p. m.

Thus our workday deprives us of sunlight in a part of the day of great importance to human and consequently factory efficiency. It also interferes to a considerable extent with our business relations with Europe. Moving the clock ahead 1 hr. will substitute a cool morning working hour in summer for a warm afternoon hour; in winter it may place breakfast before sunrise, but will bring a greater amount of daylight into the working hours at the end of the day.

Increased daylight in the hours of greatest fatigue will lessen tuberculosis, reduce eye strain, increase personal efficiency and will materially lessen industrial accidents. Greater opportunities for education after work hours would be available and the entire social life of the nation would benefit. Furthermore, there would be large direct savings in expenditure for artificial light, the latter an important factor to manufacturers.

Bills have already been introduced in the House and Senate and President Wilson has expressed his approval of the plan, so that action during the present session of Congress is possible.

Our Foreign Trade Problem

One of the most important committee reports was that by the Department of Commerce, which pointed out the marvelous increase in efficiency of European nations brought by war conditions as a prime factor in making these countries formidable rivals of the United States for the world's trade upon the cessation of hostilities.

The basic fact emphasized in the report was: "If we as American business men, individually and collectively, can produce and distribute with as little waste of materials, manpower and opportunity as our foreign competitors, we shall succeed. If we do not, we must sooner or later suffer; for we shall be threatened and outdone in domestic markets as well as in those abroad. There is no escaping this basic issue. We may pile up wealth and gold reserves, establish scientific tariffs, negotiate the best of commercial treaties, carry on the most vigorous foreign trade propaganda, legalize combinations for exporting—we may make a hundred wise accessory moves, but unless they are backed up by a business

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fundamentally as efficient as that of our competitors they can give us no security."

Europe has been fitting its factories with modern American automatic machinery for the quantity production of war munitions and this equipment can be equally effective for quantity output of peace products after the war. Workmen have been receiving practical scientific training and women have been introduced into industrial vocations to such an extent that the tremendous wastage of men killed and crippled in battle will not handicap these nations as the American public assumes. Practically all the women workers will continue to be at least a potential labor supply during the period of reconstruction and when the surviving three-quarters or even two-thirds of the armies are added, the available supply of trained labor will be found larger than at the outbreak of the war.

Co-operation, too, has made great strides in Europe. Business men work together, not against each other. Governments keep in close touch with business needs and supply them, whether for foreign or domestic trade. In England forty official committees of exports are now engaged in matters relating to the maintenance of trade after the war. Similar committees are working in France, Germany and other countries.

How the Government Can Help

With a view to offsetting the gains in business economy made by our competitors, the committee proposed the addition of four closely-related functions to the Department of Commerce:

1—To find out in detail what it costs to do business in the United States.

2—To deduce sets of reasonably attainable standards for the various items of expense in the various lines of business. This work, of course, would have to be done by easy stages as the facts become available.

3—To tell manufacturers and merchants how to attain the standards set.

4—To ascertain the best methods in use in each industry and to improve them.

The work should not stop here, however, as the most economical method of distribution in each case should be determined to strengthen our economic fabric.

Export trade is now as much of a necessity to the industries of the United States as domestic business, Secretary of Commerce Redfield told the Chamber in his address on Business Conditions. He pointed out that we are at the dawning of a new commercial era in which the role of the United States is far different from that formerly played. Industrial and commercial requirements are already changing and in the future co-operation and greater business efficiency will be necessary, while the wasteful methods at present in almost universal use in this country must give way to more intensive production. Export trade is essential to the preservation of the reserve on which our home credits depend.

Under the new conditions men of science must be welcomed into our factories, the metric system of weights and measures adopted and the work of the trade and technical association developed. Mr. Redfield approved particularly of the way in which the business trade associations are improving the scientific side of business by standard cost accounting systems, etc., and also of the elimination of individual selfishness in the work of these organizations.

Essentials of foreign trade development in the opinion of the American Chamber of Commerce of Paris were stated by its delegate to the Chamber, Mr. Shoninger, to comprise:

1—A bargaining tariff using a specific weight system instead of the ad valorem.

2—More complete co-ordination of all industries.

3—Facilitation of banking arrangements.

4—Co-operation between manufacturer and exporter in establishing American selling agencies abroad.

5—Elimination of unnecessary intermediaries; and

6—Education of representatives for foreign trade work.

Education Necessary

Education for Foreign Trade, an address by Wallace D. Simmons, president of the Simmons Hardware Co., St. Louis, emphasized the necessity for making such education a matter for the entire population of the country instead of only for a chosen few. It is a hopeful sign, Mr. Simmons said, that business men are turning to commercial technical and industrial education as this is essential to the development of a permanent foreign trade.

After reporting the successful completion of arrangements with the Bolsa de Comercio de Buenos Aires for arbitrating disputes affecting trade with Argentina, the Committee on International Commercial Arbitration stated that similar agreements are under way with the Comara de Comercio de Montevideo, for Uruguay, and urged action with the other Latin American countries.

Practical arbitration in our trade with Argentina is especially opportune as complaints have come from that country that American exporters were not complying with their contracts and the Federal Trade Commission reports that in Latin America unfair competition against our goods and trade by European rivals frequently takes the form of calumny.

The establishment of an American museum in Paris for developing trade between the United States and France, securing the benefit of a most-favored-nation clause in treaties with other countries and a new Russian-American commercial treaty were recommended in the report of the Committee on Foreign Relations.

An American trade museum in Paris would greatly benefit our commerce, it was stated, if the American Chamber of Commerce in Paris, for example, were to take the responsibility for conducting it. Such control would be necessary to insure against deterioration of the museum.

European nations after the war will favor their allies and restrict their enemies' trade. We must study these European agreements to safeguard our interest.

Uniform Bills of Lading Needed

To insure sound and uniform bills of lading, the committee on this subject recommended a central bureau which should receive copies of all export and import bills in both the foreign and domestic trade of the United States. For this purpose an agreement could be effected with the carriers transporting goods to send copies of bills to this bureau, thus preventing the practice of issuing accommodation bills in foreign ports, if such a practice exists, as well as furnishing a protection against forgery. Several glaring cases of forged bills of lading and accommodation frauds were mentioned, the perpetrators in each case having escaped punishment.

"The one great need in connection with the form of our bills of lading," says the committee's report, "and the form of our insurance policies is uniformity." If the forms of the bills of lading are uniform the committee thinks it then becomes merely a question of insurance, the only requisite being that there shall be no gaps between the bill of lading and the insurance policy.

The committee recommended, first, to make adequate provision against the circulation of forged bills; second, to make bills of lading and insurance policies uniform; and, when such uniform forms have been obtained, to make them permanent. This program involves a great deal of work and effort, but as the committee said: "It is worth while expending some effort to make safe the handling of 5 or more billions of dollars of bills of lading each year."

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FOUR-WHEEL-DRIVE HISTORY

Vehicles Have Been Built for Last 14 Years

To the Editor, COMMERCIAL VEHICLE:

What information can you supply on the early history of the four-wheel drive up to date?—L. J. M., Oshkosh, Wis.

As far as is known the first attempts at building four-wheel-driven motor vehicles were in Europe, both in England and on the Continent, but the first to attain such a degree of success as to be marketed was produced by an American in the United States. Some of these early ones swung their axles at their centers for steering purposes. Later an attempt was made in Kansas City in which the drive was taken through steering knuckles.

The first four-wheel-driven truck to be marketed was built by Thomas H. Millington in Milwaukee in 1903. The Four-wheel Drive Wagon Co. was organized in June of that year and started the construction of a chain-driven four-wheel-driven truck under patents granted to H. O. Franz, covering the feature of locating the steering pivot in the plane of the rim of the wheel. The truck was of 4 tons' capacity and was finished in October of 1903. It was provided with chain drive, but on account of its being used to haul limestone and cement in the experimental service, the decision was soon reached that all of the driving parts should be inclosed and running in oil.

Accordingly Millington began the construction of a bevel-driven truck of the same capacity under original patents, the first shaft-driven four-wheel driver being completed in the summer of 1904. A 7-tonner was finished a year later. Oscar Stegeman was the chief engineer of the concern during all of this development period, having later organized the Stegeman Motor Car Co., Milwaukee, of which he is president.

In March, 1907, the company became defunct due to financial difficulties, at which time it was producing one truck per week of an average value of $5,000. One of these trucks of 10-ton capacity was sold to the Aurora-Elgin-Chicago Railroad Co. on June 6, 1906. It was acquired in 1911 by the Clay Products Co., Brazil, Ind., in whose heavy service it has been ever since.

Devoted to topics pertinent to commercial vehicle operation design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

At about the time Millington was working out a gasoline-mechanical four-wheel transmission system, Joseph Ledwink, now of Philadelphia, developed a 10-ton electric with a motor in each wheel, in Detroit. One or two of these machines was built and then the company abandoned its efforts.

Something along the same line was constructed in Chicago in 1904-5, being called the Couple-Gear wagon. It was of the gasoline-electric type, a gasoline engine generating current to drive the Couple-Gear electric motor-wheels. Soon after the Couple-Gear Freight Wheel Co. of Grand Rapids, Mich., started manufacturing both gasoline-electric and battery electric vehicles of both four-wheel and front-wheel types, which it has since continued to do.

In 1909 the Four Wheel Drive Auto Co. was started in Clintonville, Wis., using the same live steering knuckle which Millington had started with and driving by bevel gears to both axles, only the front ones steering. The first vehicles were passenger cars, but these were soon followed by commercial models and are made to-day in large quantities.

P. J. F. Batenburg, a Hollander who had had considerable training in the works of several French makers who had experimented with four-wheel drives, was employed as chief engineer to improve the detail of the truck, which has made it possible to evolve the present excellent vehicles from the crude beginning. It is interesting that, while he had assisted in the design of several of the European methods of constructing dirigible driving axles, he retained the original globular steering knuckle inclosing the universal as superior to the European constructions.

At about the same time a Mr. Rosenberg built a four-wheel-driven truck at Mankato, Minn. In this design, for the first time, the European scheme was introduced in this country. The Panhard geared knuckle-joint was used. This comprised a live axle with a live steering knuckle carrying two bevel gears, one of which took the drive from the axle shafts and the other transmitted it to the wheel spindles. This was later moved to Nevada, Iowa, and its name changed from Kato to Nevada.

Another Rosenberg, chief engineer of the M. & S. Gear Co., in 1910-11 designed a four-wheel drive in Ohio, using the same scheme as the Clintonville concern. This construction is now used by the James Boyd company in Philadelphia on four-wheel and front-wheel-driven fire apparatus.

Still later the Duplex-Power Car Co. of Charlotte, Mich., started with a construction somewhat similar to the Latil of France, except that where the Latil used external gearing, the Duplex was internal-gear-driven. The method used is to drive the wheels individually by spur pinions attached to flexible shafts. In the Latil, these are floating shafts, carried at their inner ends by a differential attached to the frame. The Duplex design had the differential bolted to an I-beam solid axle.

Subsequently the Thomas B. Jeffery Co. secured a license to build trucks on the same principle as the Duplex, but with a few changes in the disposition of the parts. This has been very successful, being made in the largest production of any four-wheel-driven vehicle.

In 1912 the Walter Automobile Co., now the Walter Motor Truck Co., New York City, was licensed by the Latil people in France to construct four-wheel-driven trucks on the French patents. It also adapted the idea to front-wheel-driven designs.

The Ware four-wheel-driven truck was built about 1912 by J. L. Ware, St. Paul, Minn., this design being similar to the standard two-wheel-driven type, but having a secondary shaft extending from the rear axle to the front axle and on one side, thus driving from the motor to the rear axle and from thence to the front axle, with an open yoke for the steering knuckle, in which was the universal. This has since been changed so that now there are two shafts extending from the differential of the rear axle to the inner ends of short axle shafts on the front axle.

In 1914 the Golden West Motors Co., Sacramento, Cal., developed a four-

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wheel-driven truck somewhat similar to the Clintonville design, saving that it had worm drive instead of bevel.

Hoadley Bros. of Gosport, Ind., in 1915 built a four-wheel-driven truck, using double-chain drive, the jackshafts being mounted on platforms connected with the truck through fifth wheels. Jointed shafts drove the jackshafts from a line shaft in the center of the truck. This has never been placed upon the market, however.

Millington has recently perfected a new form of four-wheel-driving gear which may be applied to any standard truck, this arrangement consisting of two shafts which run from the sides of the gearset, alongside the motor and to individual worm gears adjacent to the steering knuckles, the differentials being on the shafts instead of on the axle.

CAN USE TRACTOR PROFITABLY

Nutmeg Manufacturer Thinks Trailer System Would Economize

To the Editor, COMMERCIAL VEHICLE:

Our business consists of marine hardware. We have four shipping departments, that is, the foundry, the galvanizing shop, main shipping room and auxiliary shipping department. Our 2½-ton Blair takes care of the interdepartmental trucking, that is, from one section of the works to the other. A. Brazos & Sons, local truckmen, take care of the majority of the freights and boat shipments, both to and from the factory.

Our ideas in changing over, if we ever do, would be to have one tractor and four trailers so that each department would have a trailer subject to be loaded at all times and the tractor would take the loaded and leave the empty and in that way relieve possible congestion and the long waits that have been detrimental in our trucking problem. If this outline is sufficient for your purpose we should be very glad to hear from you on the subject, giving information on this type of motor-driven vehicle, namely, the descriptions and prices of various tractors made, etc.—THOMAS HOOPS, JR., general manager, Wilcox, Crittenden Co., Middletown, Conn.

As nearly as can be judged from the description which Mr. Hoops gives of his conditions, it would seem that the interchangeable tractor-trailer system would be admirably adapted to the requirements. It would be instructive to know how much of the trucking is of incoming and how much of outgoing goods; how much of the goods is bulk freight for shipment in carload lots and how much is l. c. l., and how much local city delivering is done.

Although it is not stated whether such is the case, there would seem to be no good reason why the receiving and shipping departments of the different divisions of the plant might not use the same platforms, so that the tractor might back in a load of incoming goods, uncouple and leave the trailer there while about other work, the platform crew meanwhile unloading the incoming consignment and loading the outgoing one.

Great economy would probably result from arrangements being made at both the railroad freight station and the dock for the trailers to be left at their platforms as well as at those of the plant, so that loads at that end as well as at the plant end might be unloaded and loaded while the tractor is busy at something else. This would require not four trailers, as Mr. Hoops outlines, but seven, one at the railroad station, one at the dock, one at each of the four departmental loading platforms, and one more always in transit.

While it is assumed in the above that the semi-trailer is best adapted, this may not be the case. It may be that nest or demountable bodies will fill the bill better, or full trailers to be hauled behind a full tractor or a truck.

A semi-trailer is a two-wheeled affair with a fifth wheel, like a horse wagon, which rests on the back of the tractor. The trailer can be constructed by any wagon builder or by one of several concerns who specialize in such equipment. Among the latter are:

Chicago Pneumatic Tool Co., Chicago.
Los Angeles Trailer Co., Los Angeles, Cal.
Martin Rocking Fifth Wheel Co., Springfield, Mass.
Shadbolt Mfg. Co., Brooklyn, N. Y.
Variety Mfg. Co., Chicago.
Watson Wagon Co., Canastota, N. Y.

The semi-tractor may be a standard truck chassis without the body, a chassis with a shortened wheelbase, to give a shorter turning radius, lighter weight and greater strength, or a special tractor built for the purpose. Manufacturers of most makes of trucks will equip them for use as semi-tractors. Makers of tractors especially intended for semi-trailer use are:

Couple-Gear Freight Wheel Co., Grand Rapids, Mich.
International Motor Co., New York City.
Kelly-Springfield Motor Truck Co., Springfield, Ohio.
Knox Motors Associates, Springfield, Mass.
Peerless Motor Car Co., Cleveland, Ohio.
Transport Tractor Co., Long Island City.
Walter Motor Truck Co., New York City.
Watson Wagon Co., Canastota, N. Y.

The nest body is a skeleton body in rack form which is on rollers and fits into a covered body on a standard motor truck. It is handled in identically the same manner as a semi-trailer, except that there is no uncoupling to do. Instead, it is merely pushed from the platform to the truck or vice versa. The demountable body is similar except that instead of comprising a body on the truck and a nest within that, the entire body is removable, leaving a bare platform on the truck.

These would have the advantage of not consuming street space when being loaded or unloaded. Nest bodies are especially adapted to use where there are a great many small, loose packages, the demountable type being preferable for all ordinary classes of work, especially where the material is of a heavy nature.

In some demountable and nest body installations the bodies are made in sections, so that there are really two or three separate bodies on the chassis. These are used as handtrucks within the plant and in the case of a manufacturing plant may be backed up to a machine or an inspector's bench for the finished parts to be thrown directly into them. They may be pushed into the stock rooms or shipping rooms, in fact to any part of the plant, and thus transfer of loads from handtrucks to the vehicle body is avoided.

Some installations of demountable bodies have, besides rollers on the bottom, attachments by which they may be moved about the plant on telpher rails by electric telpher cars.

The semi-trailer has the advantage that greater loads may be carried than on trucks and moderate loads may be pulled by relatively light tractors. The trailer, whether of the semi or full type, necessarily cuts down the speed of operation, and so where greater speed is possible, it is sometimes best to use trucks. Where the speed is low by necessity, due to traffic, and where there are considerable loads, the trailer is most economical.

The full trailer may be used in connection with a full tractor, each unit having four wheels or it may be hitched to the rear of a standard truck. In the former case the tractor may uncouple more quickly than is the case with a semi-tractor, for it is not necessary to put jacks under the trailer. Similarly it may couple more quickly, for there is no lining up of the kingbolt or removal of the jacks to be done. It is less adapted to use in close quarters, however, owing to the difficulty of backing correctly. When it is necessary to back, a reversible type must be used, which can be led backward by an extra man guiding the rear wheels by the rear drawbar.

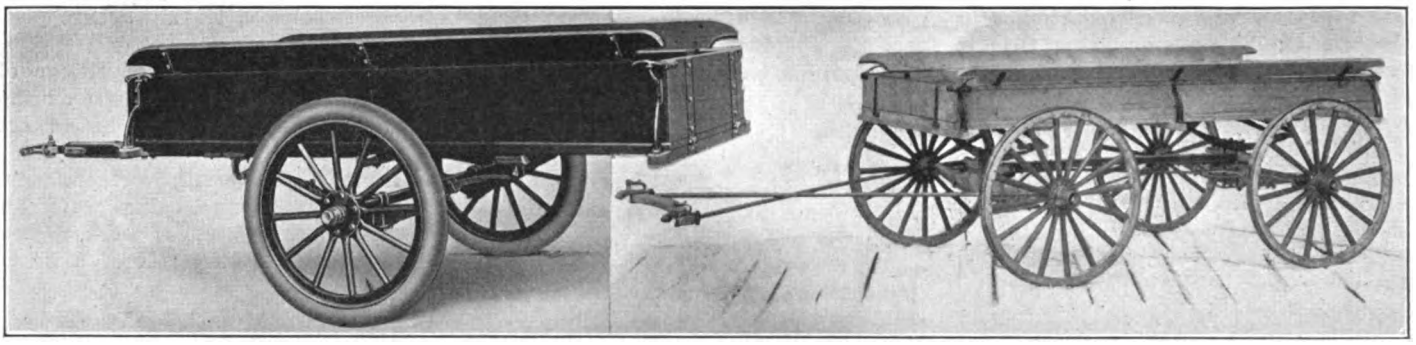
Brooklyn Truck Show March 6

To the Editor, COMMERCIAL VEHICLE:

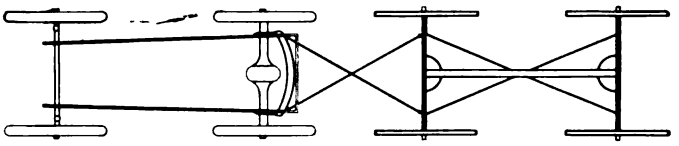
Kindly let me know the date of the truck show in Brooklyn, which I understand is to follow the passenger car show.—Y. C., York, Pa.

The Brooklyn truck show opens Tuesday March 6 at 2 p. m. and closes Saturday, March 10 at 10 p. m. It is to occupy the same building and to use the same decorations as the passenger car exhibition.

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Parry Trailers in Two- and Four-Wheeled Types

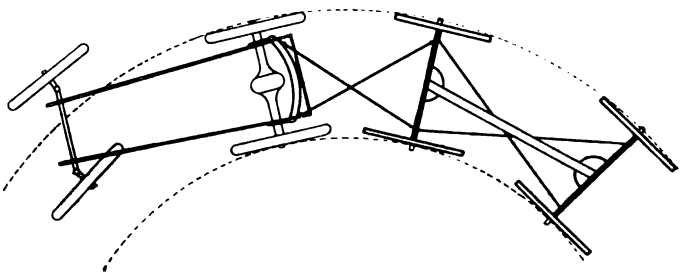


Simple Short-Turning Gear

SHORT-TURN four-wheeled trailers and two-wheeled types have recently been brought out by the Parry Mfg. Co., Indianapolis, Ind., in the former of which a very simple steering arrangement permits the trailer to follow the same tracks as the rear wheels of the drawing vehicle. Both solid- and pneumatic-tired types are made, the two-wheeled cart types having 800-lb. capacity, and the four-wheelers 1200-lb.

Either plain or ball bearings are fitted to the solid-tired types, but ball bearings only to the pneumatic-tired ones.

The steering arrangement on the four-wheelers comprises two pivoted axles, on fifth wheels, like the front axle of a buggy, the fifth wheels being connected by a wood reach. Crossed rods connect the outer portions of the axles so that when the front axle turns one way the rear one will turn in the opposite direction and to the same angle, thus causing the rear wheels to track with the front ones. Draft is taken by a similar pair of crossed rods jointed to a draft beam at the front. This draft beam is intended to be clipped to the rear axle of the drawing chassis, thus duplicating the action on the trailer. The movement of the axles in making a turn is shown in the diagram above.



Above, Parry two-wheeled pneumatic-tired trailer and the solid-tired four-wheeler. Right, diagram showing action of cross-rods is causing four-wheeler to track

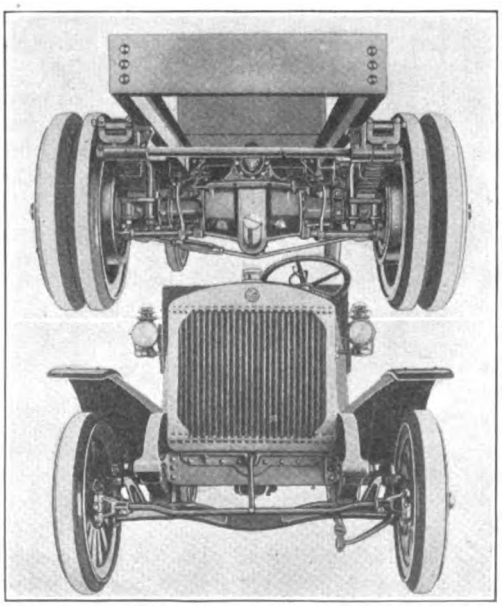
For the two-wheelers, two types of drawbars are used. One has a flat plate to be bolted to the rear end of the frame of the drawing vehicle and the other a bracket and clips to attach to the rear spring center of a Ford. Standard open flareboard express bodies are used on all models, the two-wheelers having side half-elliptic springs, that on solids of the platform type, and the four-wheelers transverse springs in elliptic form, but having two upper sections and one lower one. A demountable stage top with roll curtains is also provided for these trailers at an additional charge.

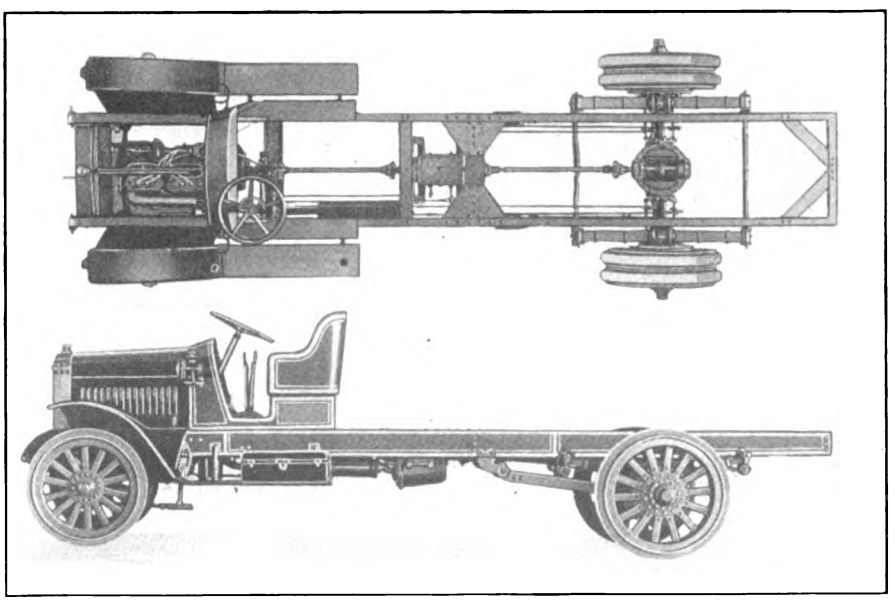
General specifications follow:

Type	two-wheel	two-wheel	four-wheel	four-wheel
Tires, type	solid	pneumatic	solid	pneumatic
Size	32x1¼	30x3	32x1¼	32x3
Track	56	56	56	56
Load platform:				
Length	84	84	96	96
Width	40	40	45	45

The wheels of the pneumatic-tired models are interchangeable with Ford front wheels.

These trailers are said not to sway on the road at speeds up to 20 miles per hour, which is as fast as the manufacturers advise them to be run. They are not designed for backing, but the four-wheelers are reversible.





New 3½-ton Acme model, showing rear and front views, to the left and overhead and side appearance at right. Note flexible rear construction, mid-frame bracing, midships gearbox and new radiator

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Bethlehem 1¼ and 2¼-tonners Have Side Doors on Cabs

Production of 10,000 Planned for 1917

EXACTLY following the same general features of design, two truck models have just been placed on the market by the Bethlehem Motors Corp., Allentown, Pa., one of 1¼-ton and the other of 2¼-ton capacity. This concern, which has only been organized a few months, plans a production of 10,000 of these vehicles during the calendar year. They are of conventional design assembled from standard components and will be produced both as stripped chassis and in several standard body types.

BETHLEHEM SPECIFICATIONS

Capacity, lb.	2,500	4,500
Price	$1,125	$1,665
Wheelbase, in.	126	144
Tires, front	34 x 3	34 x 4
rear	34 x 4	34 x 6
Bore, in.	3⅜	4
Stroke, in.	4¼	4½
N.A.C.C. hp.	22.5	25.6
Gear-ratio in high gear	7.4-1	8.3-1
Final drive	internal gear	

A Lycoming engine is used on the smaller model and a North American on the larger, both being incorporated in unit with their clutches and gearsets as unit powerplants suspended at three points from the main frame. The smaller engine is block-cast and the larger cast in pairs, both having valves to the left.

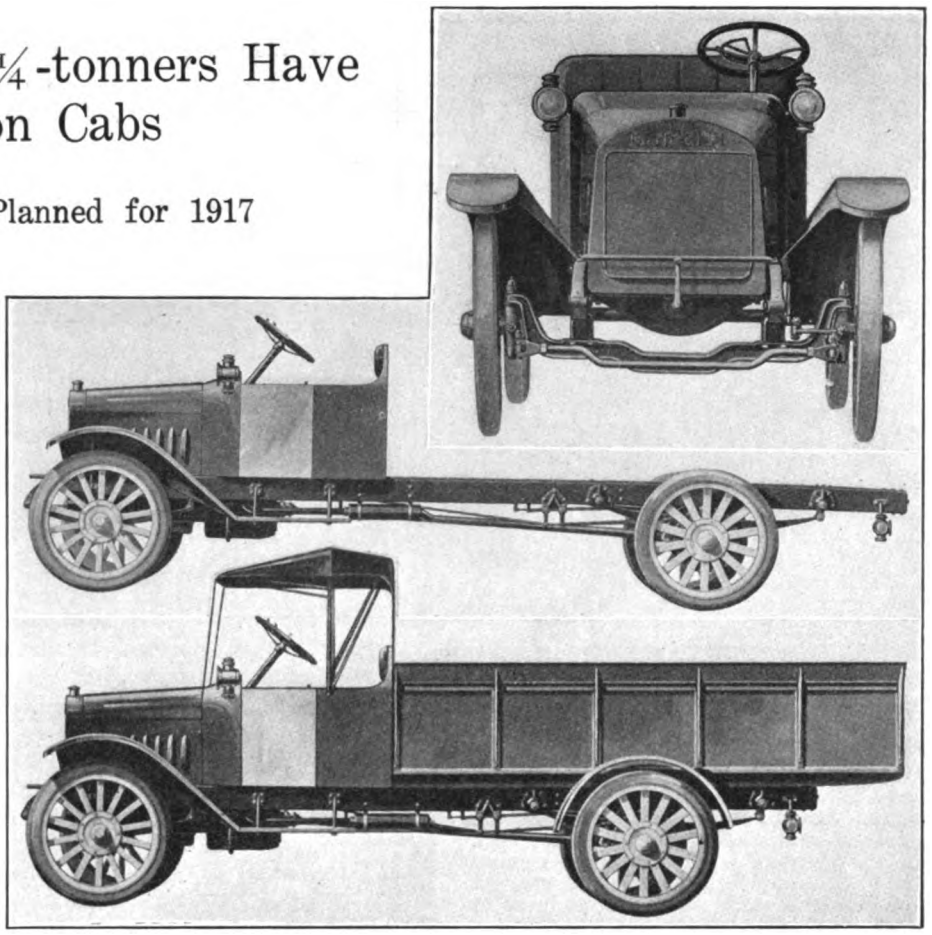
Thermo-syphon water circulation through long square-tubular sheetmetal-cased radiators is employed on both models and both have Bosch single magneto ignition with hand spark advance. They are not provided with governors. Gravity feed is used for a fuel line.

From their motors both models drive through dry-disk clutches and three-speed selective gearsets, made by the Detroit Machine Company, to Russel internal-gear-driven rear axles, from which torque and propulsion are taken by the Sheldon springs.

In the body work, individuality has been secured. They have sloping hoods over the engines, provided with louvres and merging with cowl dashes. The cab also blends with the dash on each model and has a door of the swinging type. The door is regularly painted a different color from the rest of the vehicle. Extension bow tops are fitted at extra cost. Standard control, with central levers and the steering wheel to the left, is employed.

ACME SPECIFICATIONS

Capacity, lb.	2,000	4,000	7,000
Price	$1,575	$2,200	$3,000
Wheelbase, in.	128	148	168
Tires, front	34x3	36x4	36x5
Rear	34x4	36x6	40x5d
Bore	3½	4⅛	4½
Stroke	5	5¼	5½
N. A. C. C. hp.	19.61	27.20	32.40
Speed, r.p.m.	1,700	1,300	1,200
M.p.h.	22	17	14
Gear-ratio in high gear	7¾-1	8½-1	10¼-1
Final drive	worm	worm	worm



New Bethlehem trucks. At top, head-on view showing neat hood and dash. Middle, the 2¼-tonner. Below, the 1¼-tonner. Note similarity of design in two types

Acme Adds 3½-ton Model, a Heavier Edition of Older Types

Cast Radiator, Midships Gearbox and Radius Rods

ANNOUNCED last November, but only just placed upon the market, the 3½-ton Acme model reveals several changes from the design of the smaller Acmes, but in general it follows the same essential lines.

The new placing of the gearbox, the heavier frame, made of rolled channel steel instead of pressed steel as in former models, the use of a dry-plate clutch instead of the dry-disk type formerly used and the fitting of radius rods represent the chief departures.

In the radius rods the Cadillac Auto Truck Co., Cadillac, Mich., has achieved a new wrinkle. They are used to avoid the excessive cost of rear springs capable of taking Hotchkiss drive on so large a truck, although the torque is none the less taken by the springs. To make them as simple as possible, they have been made of pressed steel and are somewhat flexible so that they are merely jointed one way, thus taking the twisting stress on them by flexure. This greatly simplifies their connections, so that universal joints, spherical seats and many lubrication points have been avoided.

The complete Acme line now comprises trucks of 1, 2 and 3½ tons' capacity.

On the new 3½-tonner the engine is located under a hood of substantially the same shape and louvred in the same manner as its smaller but older brothers, but unlike the others, it is pair-cast. It is a Continental with valves to the left and is supported direct from the main-frame on three points. Centrifugal pump water circulation through the finned-tube, cast-case radiator cools the engine. A Rayfield carbureter is fed by the Stewart vacuum system from a tank beneath the driver's seat.

Electric lighting equipment is provided for and will be fitted at extra cost. Ignition is secured from an Eisemann high-tension magneto with fixed spark.

A Pierce governor, driven from the engine, is employed.

The driveshaft is in two sections, each having two universals. The forward section connects the clutch with the gearbox and the rear section drives the rear axle from the gearset. The gearset is of the constant-mesh type, affording three speeds. The gears run on ball bearings.

A Timken rear axle, worm-driven, is employed, having the regular Timken duplex brakes. The springs are the De-

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Pull-More, Front-driven 3-tonner, Has Detachable Front End

Powerplant Opens Like Box Lid for Access



The flexibility of the Pull-More is shown in this view. Note the odd steel wheels and details of front axle and drive

GREAT accessibility of every part of the powerplant, front-wheel drive and a detachable front unit consisting of powerplant, front wheels and cab, are the three outstanding features of the 3-ton Pull-More truck to be placed actively on the market beginning March 1, 1917, by the Pull-More Motor Truck Co., Pittsburgh, Pa., with a factory in New Castle, Pa.

Brief specifications of the vehicle, which has been in course of development for the past 14 years by H. H. Marker, the chief engineer of the concern, are as follows:

Capacity, pounds	6,000
Price, tentative	$3,400†
Wheelbase, in.	153
Tires, front	36 x 6
Tires, rear	36 x 6
Bore	4½
Stroke	6
N. A. C. C. hp	32.40
Speed, r.p.m.	1050
Speed, m.p.h.	12
Gear ratio in high gear	9.9 to 1
Final drive	Double chain*

†Chassis without uncoupling feature. *To the front wheels.

troit self-lubricating type, their shackles supported by transverse rods.

In the frame construction semi-flexible action has been striven for with the greatest of diagonal rigidity. Just back of the gearbox is a wide cross-member with unusually large double gussets. At the extreme rear is another cross-member with diagonal strap braces to take any stress from trailer application. The presence of three other cross-members in the forward portion of the assembly makes the frame rather rigid in front and at the middle, confining the warp to the rear end where the greatest load is placed and where there is the greatest strength.

The great accessibility of the powerplant is secured by mounting the engine, clutch and gearset in the upper half of a hinged casting which fits into a barrel-shaped casing corresponding to the lower half of the crankcase of an ordinary motor except that it incloses all the driving mechanism between the engine and the jackshaft, including the differential. When it is desired to inspect or get at any part of the engine, clutch, gearset or differential, the upper half of the case is revolved upward about its side hinges by a screw jack operated by means of a crank applied on the end of a short turning shaft extended forward to the front of the radiator. This upper half of the casing is carried on a framework which supports the cab, radiator and hood, this entire assembly turning over as the joint between the upper and lower halves of the casing is opened to expose the interior members. The entire operation can be done in a few minutes, the starting crank being used as the handle to operate the elevating screw.

The turning of the cab is made possible without making any mechanical disconnections by mounting the steering column on a universal joint and similarly arranged links in the foot brake on the driveshaft outside of the casing at the rear and the hand brakes on the rear wheels.

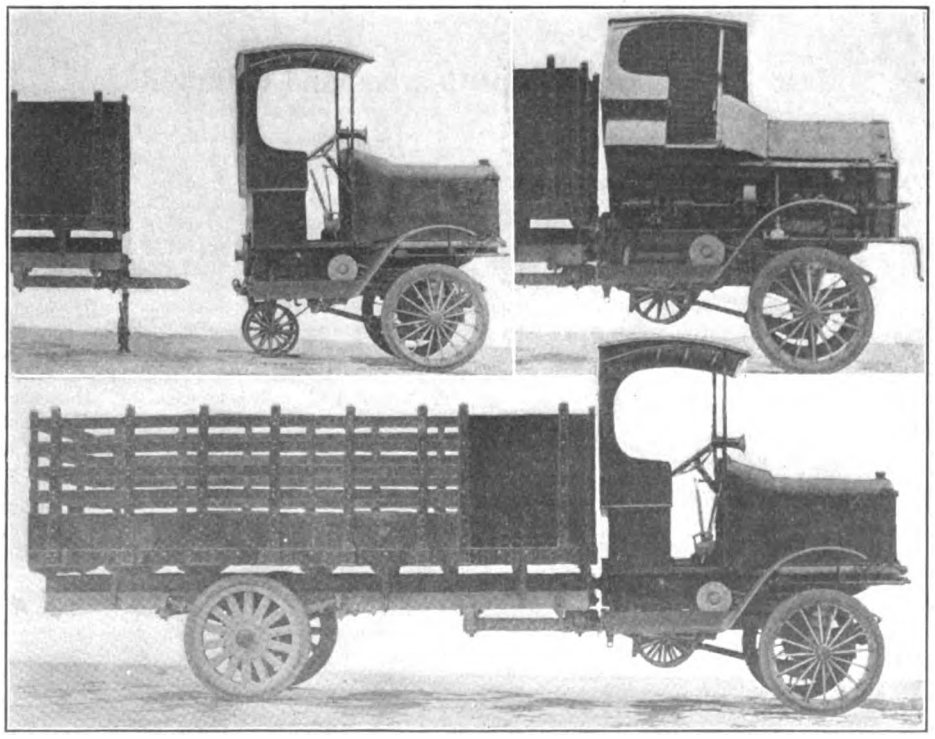
The engine is a stock Buda except for the crankcase. It has its cylinders cast in block with the valves at the right. It is cooled by means of a centrifugal pump circulating the water from a vertical finned-tube radiator with a cast case. The engine is fed by gravity from a tank carried in the dash. The engine speed is controlled by a Pierce governor. Ignition is by a single system and electric starting and lighting may be had at an extra charge of between $150 and $175.

From the engine the drive is taken through a Borg & Beck clutch to a three-speed selective gearset of Warner make. The driveshaft extended aft of the gearset is provided with a spur gear on its rear end. This meshes with another similar gear mounted on a parallel shaft directly below which extends forward to a jackshaft at a point just behind the clutch. The jackshaft is carried in the lower half of the casing, the drive being taken by outside chains and sprockets to each of the steering knuckles.

Lubrication of the engine is by the splash-pressure system, the same oil being used to lubricate all the members in the lower half of the crankcase, including the gearset, spur gears, differential and jackshaft.

The lower half of the crankcase is in turn supported in a similarly shaped casting and yoke carried in two bearings on the front and one at the rear, the front ones being mounted at the centers of the upper members of elliptic springs on both sides.

Each wheel is carried on a stub driving shaft and the drive taken in much the same manner as in the Panhard four-wheel-driven tractor. A hollow steering knuckle housing is employed in which there is a vertical idler shaft with bevel gears at top and bottom, that at the top meshing with a similar gear on a short horizontal jackshaft with the chain sprocket at its inner end, and that at the



The whole Pull-More story. Above, left, front unit detached, showing small supporting wheels in action. Above, right, coupled up, wheels raised and upper half tilted over to expose entire power line. Below, the complete truck

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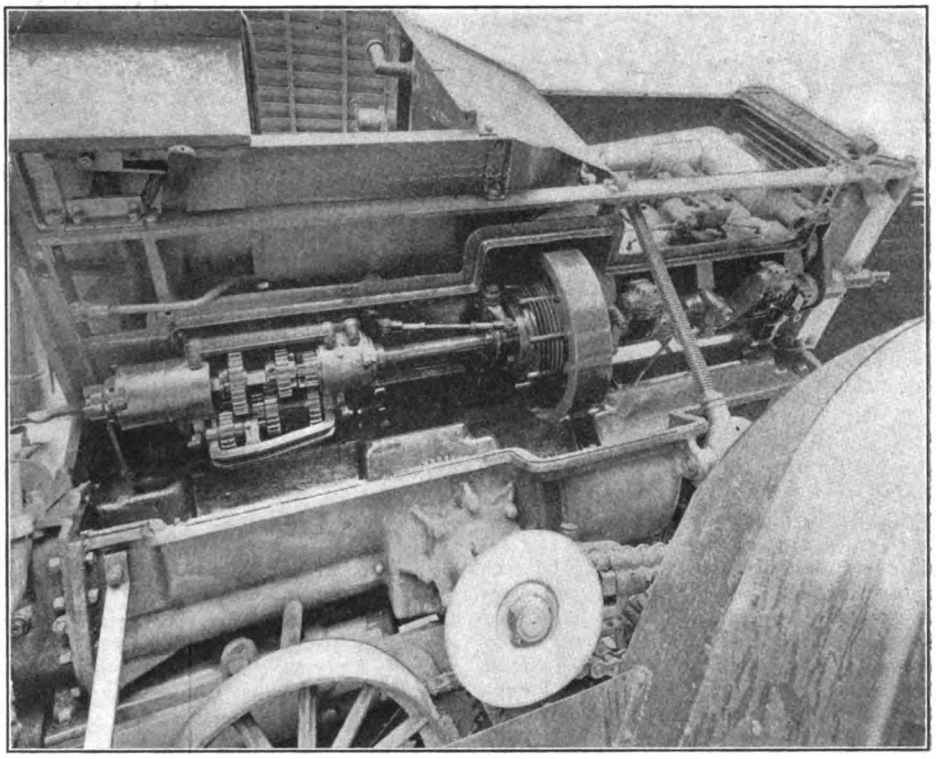
bottom with a bevel gear on the stub shaft.

The front end of the truck is uncoupled from the rear end through the employment of a tapered telescoping reach with the female member attached to the barrel-shaped casting below the engine crankcase and the male member to the underside of the frame carrying the body and rear wheels. The pulling strain between the two units of the vehicle is transmitted from the front end of the reach to the front axle by means of a spring drawbar with a yoked end pivoted to flanges on the axle.

This uncoupling feature of the truck is intended to enable unproductive loading and unloading time to be eliminated if more than one load unit is used. The power unit can move from point to point under its own power by means of two small hinged auxiliary wheels which may be swung down to the ground as a support for the rear end. It is not necessary to disconnect the brake rod system for the hand brakes on the rear wheels when the two halves of the vehicle are uncoupled. This is accomplished automatically by the use of two rubbing shoes and levers in the line directly aft of the rear end of the cab. When the two parts are joined the two shoes are in contact so that the operation of the hand brake lever sets the brakes as usual.

As standard equipment, the load unit consists of a dead axle, springs and body frame of conventional type, although the absence of any driving mechanism will enable the Pull-More company to offer load units with platforms as low as 18 inches as special equipment.

About 15 per cent of the capacity load is carried on the front wheels, this serving to distribute the total load equally between front and rear wheels. These are of cast steel with outwardly dished solid spokes. Left steer and center control are employed.



Close view of power unit with upper half tilted, showing unit powerplant casing and complete system of transmission

Gem 1000-pounder Has a Complete Electrical Equipment

Rear Fuel Tank and Gravity Feed

A NEW product hailing from Kalamazoo, Mich., is the Gem light delivery vehicle, produced by the Gem Motor Car Corp. It is made in one model of ½-ton capacity, laid out on conventional lines.

The engine is located under a louvred hood set well back of the front axle. The clutch and gearbox are bolted directly to the flywheel bell-housing, the whole powerplant being suspended direct from the frame on three points. It is a G. B. & S. cast in block, with valves to the left. Thermo-syphon water circulation is employed. The radiator being of the cellular type with a sheet-metal casing.

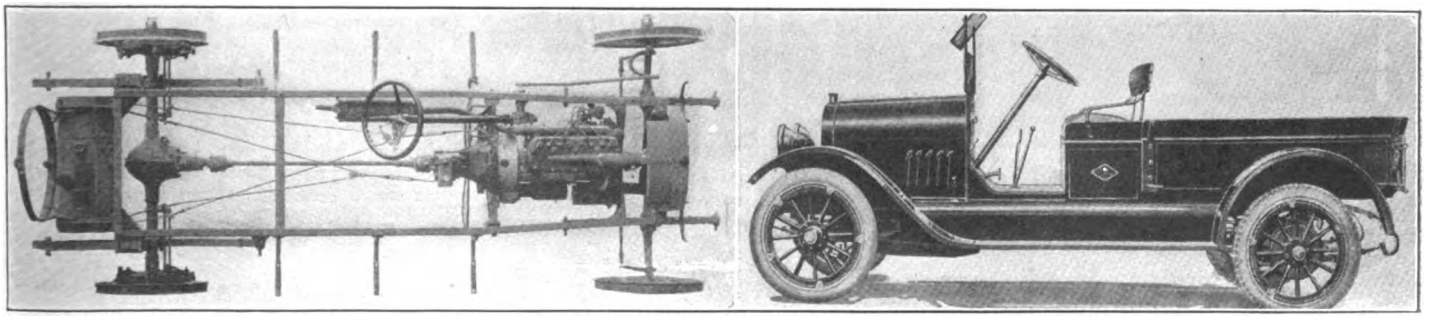
The Carter carbureter is fed by gravity from a tank at the rear of the chassis. Ignition is supplied by a Connecticut distributor and coil with hand advance, with current drawn from the 6-volt 80-ampere battery used in connection with the Dyneto two-unit starting and lighting system which is stock equipment.

The clutch is a wet-plate type driving a three-speed selective gearset, the clutch being made by Golden Belknap & Swartz and the gearset by the Grant-Lees Gear Co. A shaft with two universals transmits the drive to the Walker-Weiss bevel-driven rear axle. Hotchkiss drive is incorporated, the rear springs being of the three-quarters-elliptic type.

Foot brakes act externally on the wheel drums, being equalized by pull cables which run over a pulley at the end of the rod which connects with the brake pedal, this rod having a simple turnbuckle for adjustment, the turnbuckle being directly under the floorboards, within easy access. Hand brakes are internal on the same drums and have the same connections with their control. The brake lever is very neatly mounted on a central plate mounted on the gearbox cover, both it and the gearshift lever being of the ball-and-socket type. The gearshift lever has a ball handle, the brake lever having an offset one with a latch button. The ratchet for the hand brake is concealed by the central flush floor-plate.

GEM SPECIFICATIONS

Capacity, lb.	1 000
Price	$600
Wheelbase	112
Tires, front	31x4
Rear	31x4
Bore	3¾
Stroke	4¼
N. A. C. C. hp.	22.50
Gear-ratio in High gear	4–1
Final drive	bevel



Overhead and side views of Gem, showing simple chassis lay-out and trim lines of vehicle

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Accessories for the Truck

Eccentrics Operate Gould Locking Differential

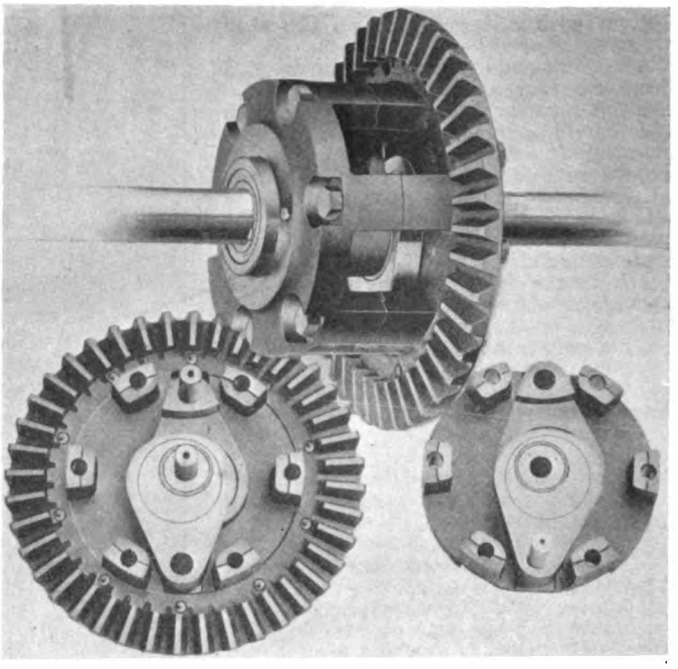


Fig. 1—Gould differential, assembled and separated, to show disposition of the eccentrics and links

ECCENTRICS operate the differentiating element of the Gould differential, their use permitting correct balance action while at the same time giving positive drive. In the Gould device there are no gears, no springs, no clutches and no friction devices. Instead there are four eccentrics and four eccentric links assembled in a differential casing interchangeable with that of a gear differential. There is a central plate which bolts to the driving crown gear and which carries slots in which the wristpins of the four cranks slide. The axle shafts are squared or slined into the hubs of the eccentrics, which are grouped into right and left pairs whose only connection is through the links. Eccentrics are set at angles of 90 deg. to each other in each pair.

The eccentrics are so set that opposite pairs of links must at all times oppose, that is, if a given wrist-pin moves inward, it must tend to revolve the eccentrics in opposite directions. This is the identical action of a bevel-gear differential. It differs, however, in that the motion is irreversible, since motion can only be transmitted from the eccentrics to the links and never from the links to the eccentrics.

In action, therefore, assuming the vehicle to be on a smooth straight road, the thrust of the links will be opposite and the only tendency will be to turn the two wheels at equal speed. If the vehicle makes a turn, however, there will be a tendency on the part of the outer wheel to run faster than its drive. This will cause the outer eccentrics to turn within their links. This turning will cause the wristpins to move either inward or outward, transmitting the motion to the opposing pair of links and thereby permitting the other eccentrics to slow down an amount equal to the acceleration of the outer ones.

This constitutes a balance action and the possibility of doing this without transmitting motion from the secondary or inside links to the secondary eccentrics is explained by the fact that there is a natural tendency on the part of the inner wheel to slow down due to its own inertia.

Positive drive is at all times maintained, due to the constraint of the wristpins in their radial slots.

In negotiating a slippery spot, spinning of one wheel is impossible, owing to the fact that there must be a predisposition on the part of the faster wheel to run ahead of the other one before it will transmit any motion to the links and the links themselves are incapable of transmitting any motion to the eccentrics, but only of receiving such motion and restraining it.

The device is made in standard sizes by the Gould Motor Parts Co., York, Pa.

Improved Pierce Governors—New Type Has Two Drive Connections

IMPROVEMENTS, looking toward greater simplicity, strength, rigidity and ease of adjustment, have been made in the Pierce governor, the product of the Pierce Governor Co., Anderson, Ind. There has also been a new addition to the catalog in the form of a double governor, driven from two sources and known as the Dual-purpose type.

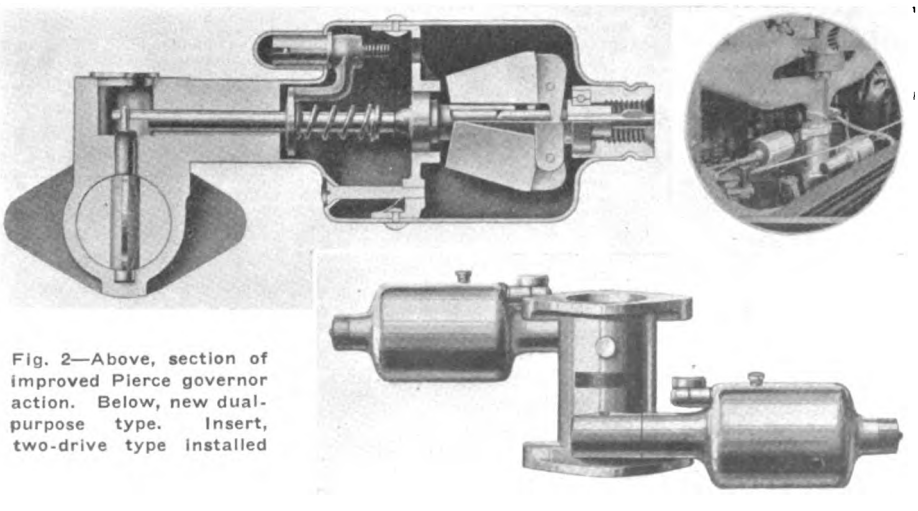


Fig. 2—Above, section of improved Pierce governor action. Below, new dual-purpose type. Insert, two-drive type installed

The mechanical improvements are only in detail, the centrifugal principle being still employed. As is shown in Fig. 2, the governor consists of a pipe section to be inserted in the inlet line between the carbureter and inlet manifold containing a butterfly valve quite separate from that in the carbureter. A horizontal cylindrical casing incloses the centrifugal governing element, the connection between which and the butterfly valve is a rod, in the tubular connection between the governor case and the manifold fitting.

In the new design a simple bell-crank on the spindle of the valve has replaced the former rack-and-pinion. The spring surrounds the plunger rod instead of being to the side, as in former designs, and an inspection plate has been placed over the bell-crank action to permit quick access. The adjustment of the governor is by means of a small knurled thumbnut, which varies the spring tension and such adjustment is sealed by a wire seal which passes through it.

The new Dual-purpose type really con-

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sists of two Pierce governors attached to the same manifold connections. In all Pierce instruments the drive is by means of a flexible shaft from the spindle to any driving connection that may be convenient, in the same manner as a speedometer. In the Dual-purpose type there are two of these, one of which is intended to run forward to the timing gears, the other back to a driveshaft connection.

By adjusting the two governors properly, each is made to operate independently, the driveshaft drive preventing the truck from running at a higher speed than the maximum set, but permitting it to attain that speed regardless of what gear the truck may be running in. The other, on the contrary, regulates the maximum motor speed alone.

Thus the maximum engine speed is set without reference to what speed this might represent in miles per hour of the truck, so that while the speed on high gear is kept down to a safe limit by the other governor, there is no restriction of power in the lower gears.

Variable Break Economizes Current in New Ericsson Igniter

VARIABLE break interval is the feature of the new Ericsson igniter, a combined circuit-breaker and distributer for battery ignition made by the Ericsson Mfg. Co., Buffalo. Its variable break is intended to economize current by adapting the length of contact in accordance with the speed of the engine, a short contact for low speeds and a longer one for high speeds, thus giving the relatively more intense spark required for fast running without wasting current at low speeds. This effects practically the same result as is attained in the magneto, which, because of being driven by the motor, produces a current output proportional to the speed of the engine.

The effect is secured by means of a centrifugal governor, comprising two weights, spring retained, having curved slots cut in them, in which pins attached to two separate cam thimbles are disposed. The effect of speed is to cause the weights to fly outward, moving the cam thimbles in relation to each other and so varying the length of break. This is made possible by the fact that the front section of the breaker is controlled by one set of cams and the back part by another.

Similarly automatic advance may be secured without any additional complication. For hand spark advance, the back cam thimble is anchored so that it does not change its position in relation to the shaft. In the automatic type, it too, is turned by the governor so that the time of the break is advanced as the engine gains speed and retarded as it slows down.

The metal parts are largely punchings and die castings. The breaker arm is made of sheet steel and formed so as to provide a maximum strength with a minimum weight. The contacts are especially large and are manufactured either of tungsten or platinum-iridium, depending on the characteristics of the installation. The distributer system is manufactured of electrose, and is of the jump-spark type. This means that there are no carbon brushes used, and therefore no trouble due to carbon deposit on the path of the distributer. The cable connecters combine simplicity and ease of attachment with strength and electrical protection.

Auto Hand Traffic Signal

A third hand—which every driver has at some time devoutly wished for—is provided for traffic signaling by the Auto Hand, manufactured by the Consolidated Sales Corp., Milwaukee, Wis. The device consists of a French plate mirror, square in size, with a windshield bracket, mounted on a thin metal box. Within the box is a lazy-tong carrying a silhouetted figure of a human hand. A spring tends to distend the tong and extend the hand to the side. A Bowden wire connected with a button on the steering column serves to pull the hand in, out of sight within the box and when given a slight push to release it.

Thus, when danger threatens, the driver merely touches the button and the hand shoots out. When the danger is past the button may be pulled up and the hand restored to the box. Its advantage is that on right-steered and very wide trucks, where the driver only with difficulty may reach his hand to the left, where the signal is needed, he may give the required signal without taking his hands from the wheel, where, in an emergency, they belong. The device sells for $7.50.

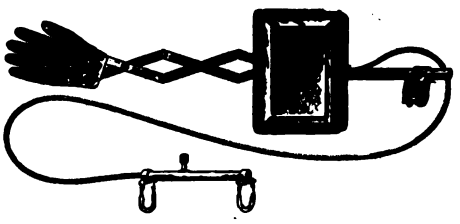


Fig. 3—Auto Hand traffic signal in extended position, showing how installed on windshield of truck

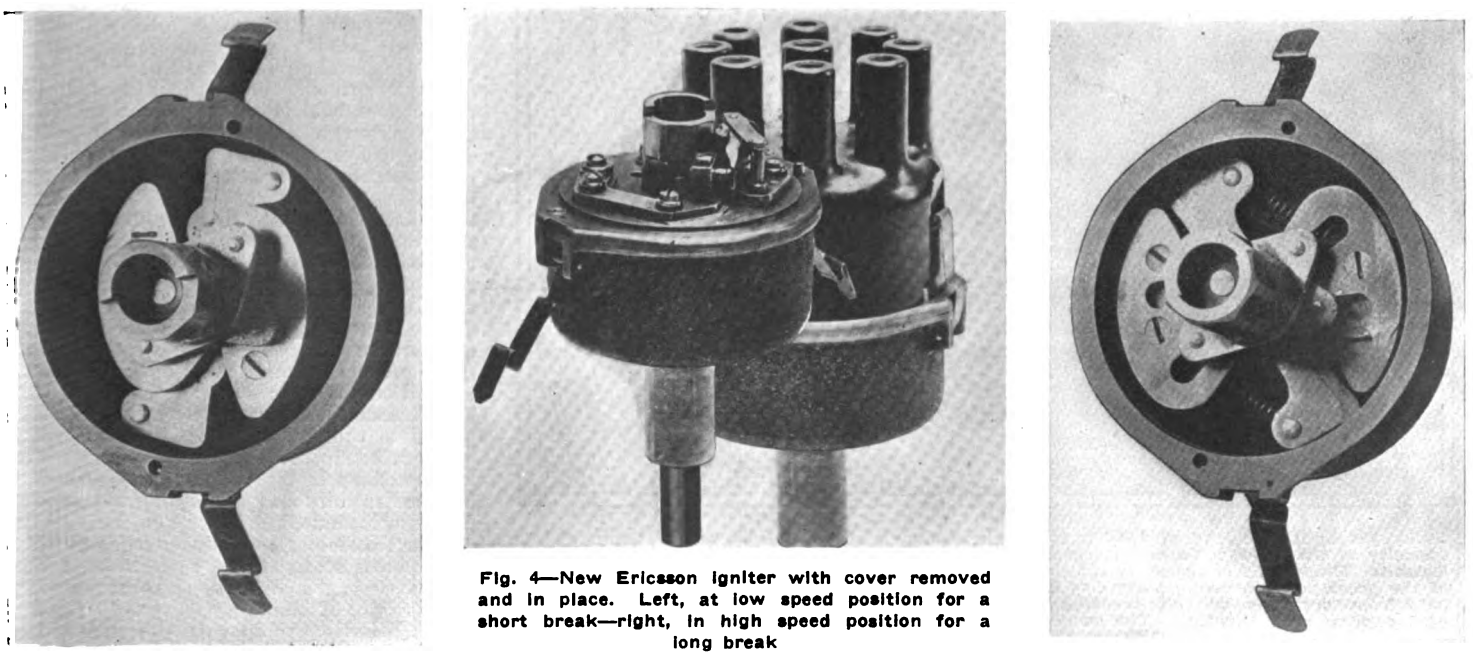


Fig. 4—New Ericsson igniter with cover removed and in place. Left, at low speed position for a short break—right, in high speed position for a long break

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Men and Makers

LANGE MOTOR TRUCK CO., Pittsburgh, Pa., now situated in the two upper floors of a four-story structure at 145 South St. Clair Avenue will move this spring to a new factory, ground for which has been purchased at the corner of Hamilton and Fifth Avenues, East Liberty, one of Pittsburgh's suburbs. The new structure will be two stories high in front, with two one-story factory wings at the rear. The front portion of the building will be 40 by 130 feet and will be used as offices. The manufacturing wings will be 60 by 170 and 190 feet, respectively. The new building will have 32,000 square feet of floor space and will enable the capacity of seventy-five trucks per year of the present factory to be more than doubled.

Selden Motor Vehicle Co., Rochester, N. Y., plans the addition of a building to its factory which will contain 14,000 sq. ft. of floor space and will parallel the tracks of the Rochester & Eastern Electric and New York Central Railroads.

Diamond-T Motor Car Co., Chicago, maker of the Diamond-T line of motor trucks, is negotiating for the lease of a new factory to cost aproximately $1,000,000 planned to be erected on Kilbourne Avenue, Chicago. It is also desirous of obtaining an option to purchase on the same structure.

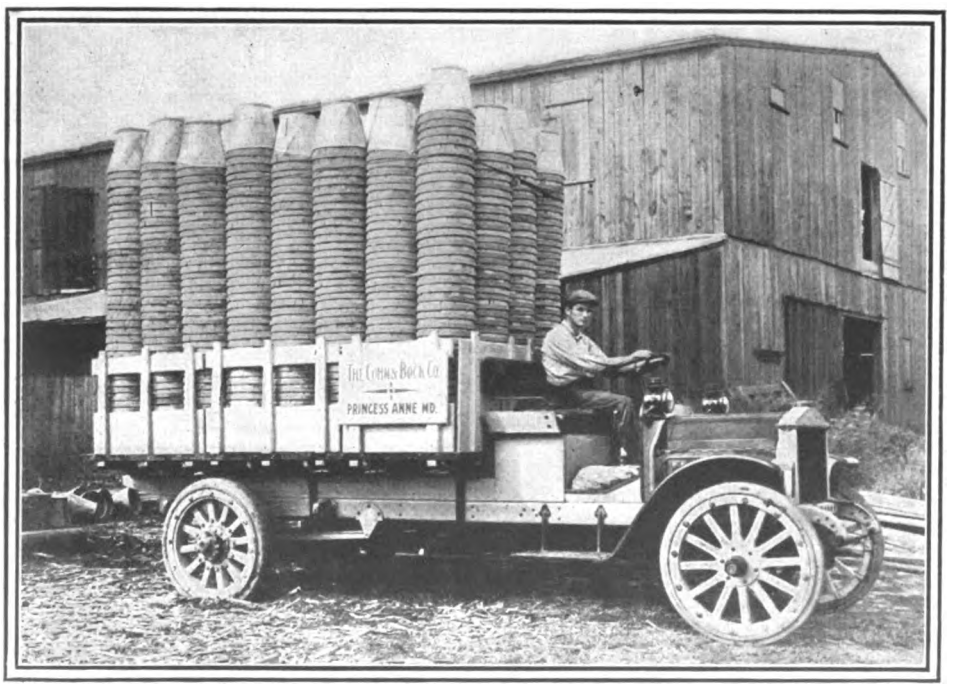
Torbensen Axle Co., Cleveland, Ohio, will erect a machine shop addition with about 30,000 sq. ft. of floor area. The contract for the work has been let.

Smith Motor Truck Corp., Chicago, maker of the Smith Form-A-Truck attachment for converting Fords and other passenger car chassis into 1-ton trucks, has broken ground for the second unit of its plant, which is scheduled for occupation by May 1, 1917.

Fuller & Sons Mfg. Co., Kalamazoo, Mich., maker of motor vehicle parts, plans the erection of a four-story factory addition to cost $150,000. It will be on a plot 60 by 176 ft.

Auto Body Co., Appleton, Wis., has been formed by D. H. Pierce and Gustav Seeger. It has already commenced operations and will manufacture bodies for both passenger and commercial types of chassis.

New York Offices of the Wisconsin Motor Mfg. Co., Milwaukee, Wis., have been moved to 21 Park Row. T. M. Fenner is in charge as eastern factory representative.



Bulky yet light, the load of 1,000 peach baskets shown above is well within the carrying capacity of the 1½-ton Federal worm-driven truck, made by the Federal Motor Truck Co., Detroit. The vehicle is owned by the Cohn & Bock Co., Princess Anne, Md., within the heart of the great peach-growing section of that state. The load is almost 9 feet in height and is kept from toppling over while the truck is in transit by means of a rope around the outside of the piles near the top. The body is furnished with removable side-staked panels to facilitate easy loading and unloading

Bearings Service Co., Detroit, and with branch offices in all of the principal cities, will open four new branches this spring in Philadelphia, Pa., Rochester, N. Y., Cleveland, Ohio, and Indianapolis, Ind. At the present time it has eleven branches in New York City, Chicago, Detroit, Boston, Mass.; Kansas City, Mo.; Minneapolis, Minn.; Seattle, Wash.; Atlanta, Ga.; Dallas, Tex., and in San Francisco and Los Angeles, Cal. The Bearings company was organized last year by the Timken, Hyatt and New Departure bearing companies to handle their service to the customer.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has just purchased about 500 acres of land at Essington, Pa., near Philadelphia, on which it will establish a new industrial center for the Westinghouse interests. The site has a frontage of approximately 1 mile on the Delaware river and additional transportation facilities will be afforded by rail sidings from the Pennsylvania and Philadelphia & Reading Railroads. The new buildings to be erected will cost between 5 and 6 million dollars and will occupy about one-fifth the area of the entire plot. The structures will consist of two large machine shops, an erecting shop for heavy machinery, forge shop, pattern and pattern-storage shops and a powerhouse. Under present plans the new center will be devoted to the manufacture of large machine units such as steam turbines, condensers and reduction gears. Work will be begun on the erection of the new buildings as soon as suitable construction contracts have been signed. Several thousand men will be employed when the buildings now planned are completed, although it is expected that eventually the center will become as large as that now located in East Pittsburgh, where more than 20,000 workers are employed.

E. F. Roberts has been promoted from general superintendent of the Packard Motor Car Co.'s plant in Detroit, to factory manager for the same concern, his new position being created to meet the demands of increased business. He will have charge of the factory operation and will be responsible for the equipment and manning of the shops. Mr. Roberts is one of the oldest employees of the Packard company in point of service. He first became identified with it 14 years ago as a toolmaker when the factory was located in the electrical shops of J. W. Packard in Warren, Ohio. He then advanced rapidly and was appointed general superintendent 6 years ago.

C. F. Tollzien, purchasing manager of the Packard Motor Car Co., Detroit, for the past 6 years, has been promoted to the position of manager of production. He has been identified with the Packard

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company for 7 years. Before joining the Packard organization he was the purchasing manager for the Buckeye Engine Co., Salem, Ohio. Altogether, he has had 14 years experience in buying.

F. W. Boynton has been appointed purchasing manager of the Packard Motor Car Co., Detroit, succeeding C. F. Tollzien, who has been promoted to the position of manager of production. Mr. Boynton has been identified with the Packard organization for the past 9 years.

R. M. Anderson has been appointed research engineer for the Packard Motor Car Co., Detroit, with Frank Wahl as his assistant.

F. E. Snell has been made manager of the southern territory for the Garford Motor Truck Co. Lima, Ohio. He will make his headquarters in Atlanta, Ga., and will handle the sales of Garford trucks in the states of Georgia, Alabama, Louisiana, Florida, South Carolina and Mississippi by the acquisition of new distributors in each of the states mentioned. The Garford company will make extensive tests of its new Road Builder truck, described briefly elsewhere in this issue, in the territory under Mr. Snell's supervision.

A. E. Morrison, for the last 4 years a special representative for the Maxwell Motor Co., has resigned from that concern to become western sales manager for the Rainier Motor Corp., New York City. He spent the week previous to the Chicago show at the Rainier plant in Flushing, L. I., and after the completion of the show left immediately for the far west. In the old days when the Rainier passenger car was at the height of its popularity, Mr. Morrison was the Rainier dealer in Boston, Mass.

Claude C. Ostrum on February 15 resigned as purchasing agent for the Locomobile Co. of America, Bridgeport, Conn., maker of Riker trucks. He has become associated with the Parish Mfg. Co., Detroit, in an executive capacity. Mr. Ostrum is a Yale graduate who was associated with the Midvale Steel Co. before joining the Locomobile organization as assistant purchasing agent in 1910. He is succeeded by J. E. Forgy, formerly assistant purchasing agent.

H. J. Newman has resigned as assistant sales manager of the Atterbury Motor Car Co., Buffalo, N. Y., to join the sales department of the Garford Motor Truck Co., Lima, Ohio.

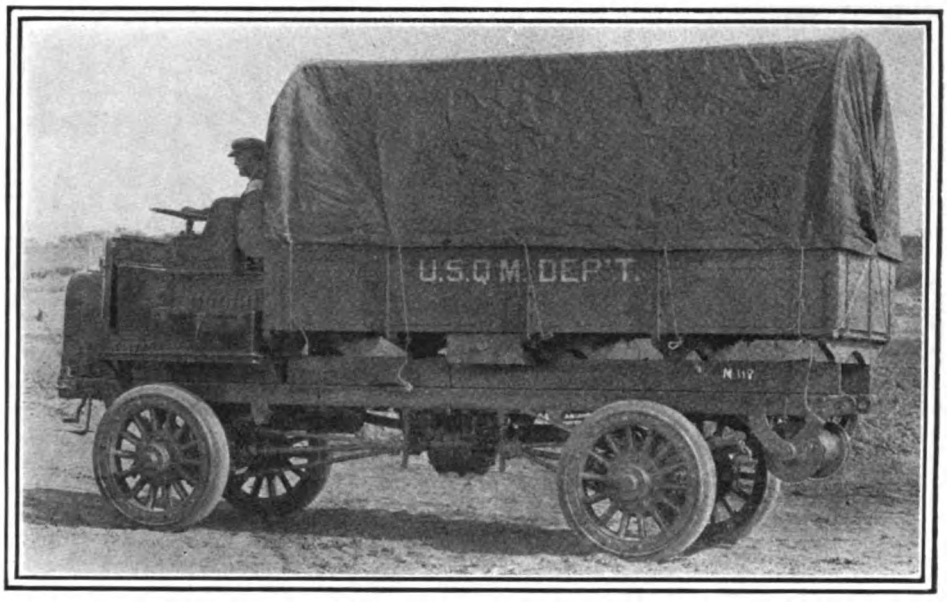
H. L. Kepler has been appointed purchasing agent of the Briscoe Motor Corp. He was formerly assistant purchasing agent for the Chalmers company.

John C. Jay, Jr., has resigned as vice-president of the Maxwell Motor Co. Previous to that time he resigned from the chairmanship of the board of directors, being succeeded by James C. Brady.

A. B. Willeman has resigned as superintendent of purchases for the Briscoe Motor Corp., Jackson, Mich.

H. A. C. Fay, manager of the Service Recorder Co., Cleveland, Ohio, has been appointed general manager of Frank G. Robins, Inc., Hartford, Conn., distributor for the Autocar Co., Admore, Pa., maker of Autocars, in the Hartford territory. He will retain the management of the New England territory for the Service Recorder company and will make his headquarters in Hartford.

W. T. Hathaway has succeeded F. D. Phillips as wholesale sales manager of the Kansas City Overland branch. He was formerly road man for this branch.



The first of a fleet of F. W. D. 3-ton trucks to be put into service by the Quartermaster's Department of the United States Army at Christobal, Panama Canal Zone. The truck, made by the Four Wheel Drive Auto Co., Clintonville, Wis., differs from the standard chassis made by that concern in that it is equipped with a power winch at the rear as shown. The vehicle is destined to haul supplies between the various military posts in the canal zone where the roads are not yet as highly developed as in the United States. The power winch will serve to enable the vehicle to extricate itself from bogs or other situations where it may have lost its traction or to haul trailers and light artillery. The truck is equipped with a standard army body with tarpaulin top spread over semi-circular bows

Mr. Phillips has become interested in the Kansas City retail agency.

E. B. Bikle, assistant secretary and treasurer and office manager of the Lycoming Foundry & Machine Co., Williamsport, Pa., died in that city on January 28. No successor will be appointed until the next meeting of the board of directors is held.

Jerry De Cou, formerly factory manager of the Thomas B. Jeffery Co., Kenosha, Wis., which later became the Nash Motors Co. and continued the manufacture of the Jeffery Quad, has become identified with the Smith Motor Truck Corp., Chicago, maker of the Smith Form-A-Truck attachment for converting several makes of passenger car chassis into 1-ton trucks.

Robert C. Enos has accepted the position of sales manager for the Torbensen Axle Co., Cleveland, Ohio, having resigned from the American Distributing Co.

L. W. Enos, formerly with the Willard Storage Battery Co., has been appointed assistant sales manager of the Steel Products Co., Cleveland, to handle the Michigan territory.

W. A. Westlake on Jan. 17 took the position of manager of the cushion pad department of the Miller Tire Corp., 256 West Fifty-fifth street, New York City, to push the sale of the new Miller cushion pad, made by the Miller Rubber Co., Akron, Ohio. Previous to his new connection Mr. Westlake was connected with the Ajax branch in Philadelphia for a year and before that sold solid tires in New York City for 8 years, the first 4 with the Diamond branch and the last 4 with Goodyear.

C. W. Martin, Jr., for the past 5 years manager of the motor truck tire department of the Goodyear Tire & Rubber Co., Akron, Ohio, has been placed in charge of the southern district for the same company and will make his headquarters in Atlanta, Ga.

R. S. Wilson, formerly in charge of the service department of the Goodyear Tire & Rubber Co., Akron, Ohio, has been appointed manager of the motor truck tire department of the same concern, succeeding C. W. Martin, Jr., who has been tranferred to become southern district manager for the same company.

G. E. Brunner, formerly assistant to R. S. Wilson, in charge of the service department of the Goodyear Tire & Rubber Co., Akron, Ohio, has been made manager of the same department.

W. R. Bliss, formerly manager of the Boston, Mass., branch of the Goodyear Tire & Rubber Co., Akron, Ohio, has been appointed manager of the New York City district. He is succeeded at Boston by B. S. Waterman, formerly assistant manager for the New England district.

D. M. Colwell, who has been manager of the southern district for the Goodyear Tire & Rubber Co., Akron, Ohio, has been appointed assistant manager in the New York district. He is succeeded in the south by C. W. Martin, Jr., formerly in charge of the motor truck tire department at the Akron factory.

Dr. Warren K. Lewis has been appointed consulting chemist for the Goodyear Tire & Rubber Co., Akron, Ohio. Dr. Lewis is the professor of chemical engineering at the Massachusetts Institute of Technology at Boston, Mass., and is regarded as an expert on the chemistry of rubber processes.

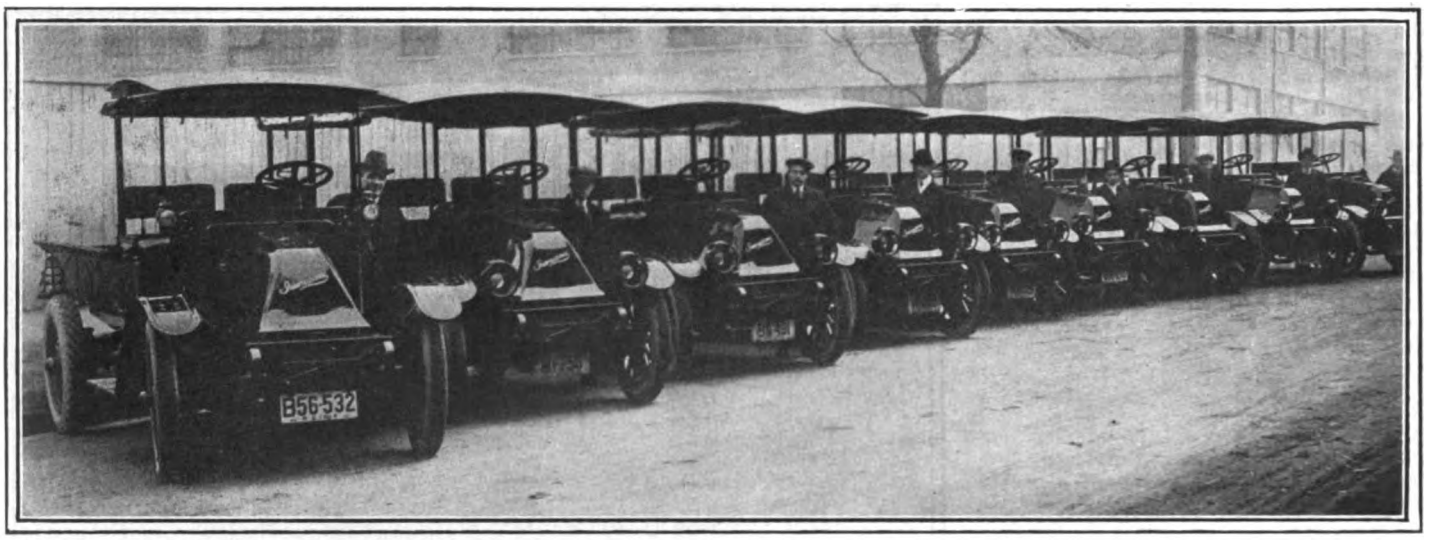
F. N. Hammond has been made branch manager for the Goodyear Tire & Rubber Co., at Cleveland, succeeding R. S. Hartzell, who has been placed in charge of makers' business in Cleveland.

C. E. Cook, Pacific coast manager for the B. F. Goodrich Co., Akron, Ohio, has been appointed to the executive staff of the central office in Akron.

Frank R. Carroll has been made Pacific coast manager for the B. F. Goodrich Co., Akron, Ohio, succeeding C. E. Cook, who has been appointed to the executive staff at the Akron plant. Mr. Carroll was formerly manager of the company's Los Angeles, Cal., branch.

Spencer Weart has been elected president of the Bound Brook Oilless Bearing Co., Bound Brook, N. J. He was former-

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A fleet of nine I. H. C. trucks recently driven overland from the Akron, Ohio, plant of the maker, the International Harvester Co., to Buffalo, N. Y., a distance by road of between 200 and 300 miles, and there delivered to dealers who had sold them in the Buffalo territory. As shown, each of the trucks was equipped with pneumatics all around, 34 by 4½ plain treads on the front and 36 by 6 non-skids on the rear, most of which were Goodyears. Each truck was furnished with an open express body with a two-seated cab and top with roll curtains

ly secretary and vice-president of the same concern, both of these offices now being abolished.

George Smalley, formerly second vice-president of the Bound Brook Oilless Bearing Co., Bound Brook, N. J., has become first vice-president of the concern and in addition will become a director and general manager.

W. F. Jennings has been appointed eastern sales manager for the Bound Brook Oilless Bearing Co., Bound Brook, N. J. The western sales territory of the company will be under the charge of H. J. Lindsey.

A. K. Smith has been appointed production manager of the Bound Brook Oilless Bearing Co., Bound Brook, N. J.

Garford Trucks Sold in the York, Pa., Territory will hereafter be handled by the York branch of the Overland-Harrisburg Co., which has just taken on the line.

Contracts for Bosch Magnetos, made by the Bosch Magneto Co., New York City, have been closed by that company with the following motor truck manufacturers, who will employ Bosch magnetos on their vehicles for the coming year: Nelson & LeMoon, Chicago; Maccar Truck Co., Scranton, Pa.; Old Reliable Motor Truck Co., Chicago; Indiana Motor Truck Co., Marion, Ind.; Lange Motor Truck Co., Pittsburgh, Pa.; Zeitler & Lamson Truck Co., Chicago; Federal Motor Truck Co., Detroit; Watson Wagon Co., Canastota, N. Y.; Continental Truck Mfg. Co., Superior, Wis.; Brockway Motor Truck Co., Cortland, N. Y., and the Brinton Motor Truck Co., Philadelphia, Pa.

Chemistry of Rubber Fellowships in the municipal university of Akron, Ohio, have been established by the Goodyear Tire & Rubber Co. and the Firestone Tire & Rubber Co. These fellowships will be open to graduates of standard American colleges, at a $300 tuition fee.

Arvac Universal Joints are well described in a new thirty-two page catalog just issued by the Arvac Mfg. Co., Anderson, Ind. The Arvac company also manufactures propeller shaft assemblies, and the method of manufacturing these as well as the universal joints are described and pictured in the new catalog, which is well gotten up and printed on glazed paper with an art cover in brown with embossed lettering in red. Some of the makes of motor trucks on which Arvac propeller shaft assemblies are used are illustrated. Among these are the Gramm-Bernstein, Republic, Denmo, Rainier, Little Giant, Indiana, Palmer-Moore, Signal, Service, Denby, Hall, Brockway and the Atlas, made by the Martin Carriage Wks., York, Pa., which formerly made the Martin truck.

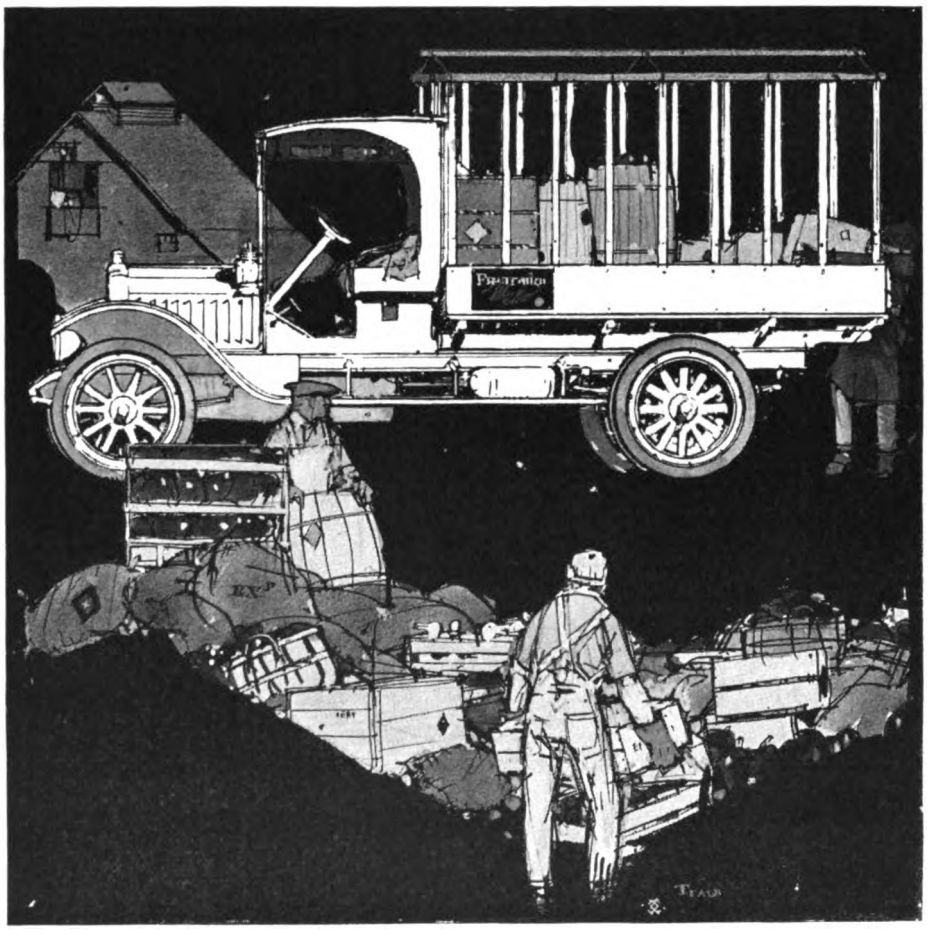
Motor Trucks Are Wanted in Spain, according to a man in that country who has written to the Bureau of Foreign and Domestic Commerce in Washington, D. C., stating that he is desirous of securing an agency for American-made motor trucks. He intends to travel through Spain exhibiting the trucks and to establish branches in various cities where occasion warrants. Correspondence may be in English. The man's name may be obtained from the main office of the bureau in Washington D. C., or from any of its branches in the larger cities throughout the United States. Refer to Trade Opportunity No. 23677, as published in *Commerce Reports* for Feb. 5, 1917.

A Good Opportunity for the Sale of Trucks in Spain is offered by a mining company in that country which is desirous of obtaining estimates on the cost of installation and maintenance of various methods of transporting 150 to 200 tons of mineral ore per day a distance of 6 miles over poor roads, with a short grade of about 3 per cent. The cost of gasoline in the territory in which the work must be done is 84 cents per gallon. Coal costs $22 per ton in the same area. The concern will consider an aerial tram, motor trucks with or without trailers, or a small narrow-gage railway. Quotations should be made c.i.f. destination and correspondence should be in Spanish. Further information may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from any of its branches. Refer to Trade Opportunity No. 23611, as published in *Commerce Reports* of Jan. 27, 1917.

Light Motor Trucks in the Gold Coast Colony of French West Africa are increasing, principally because of the network of good roads being built throughout the country. This work has gone forward due mainly to the initiative of the chiefs and people immediately concerned and who have received much encouragement, guidance and assistance from the district commissioners. This desire on the part of the population for good roads has been due chiefly to the large number of low-priced, light motor vehicles, both passenger cars and trucks, which have been imported from the United States during the past three years. Previous to 1913 the roads constructed and in use were entirely unsuited to the type of extremely-heavy, foreign-made motor trucks employed and accordingly wore out faster than they could be maintained in proper condition. According to United States Consul W. J. Yerby, stationed at Dakar, Senegal, French West Africa, there will be a continued demand for light American motor trucks and that this demand will increase from year to year as the present good roads are linked up with others in the systems in the Eastern and Central Provinces and the latter eventually with Sekondi.

Trucks Are Proving Profitable Hauling Chile's Nitrates, according to a report just received in this country from United States Consul Thomas W. Voetter, stationed at Antofagasta, Chile. The great opportunity for the use of trucks in hauling nitrate from the Chilean mines in the northern part of the country to the railroads was pointed out as far back as Nov. 1, 1916, in an article by David Beecroft, directing editor of THE COMMERCIAL VEHICLE, in the issue of this magazine under that date. Since that time one motor truck has been put into service, five more are on their way and many more are under order, awaiting a fuller resumption of shipping between this country and South American ports. The high rates of freight charged by what coastwise steamers are now in the trade make the cost of hay and grain for mules almost prohibitive, so that the mining interests have turned to the motor truck to help them solve their haulage problems. A firm in Antofagasta desires to represent a manufacturer of American trucks and desires catalogs with prices given c.i.f. Antofagasta, if possible, or if not, f.o.b. New York. The lowest cash prices should be quoted. The name of the firm interested may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., by referring to file No. 84501.

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AN INVISIBLE EXPENSE OF TRUCK OPERATION WHICH CAN BE AVOIDED

AN invisible item of expense, often overlooked by motor truck users, is the time lost for repairs. The unavoidable items of fuel, oil, tires and upkeep appear on your books, but they may not be nearly so serious a leak in your profits.

It is estimated that three days of lay-up and idleness will cost the owner more than a month's operating expense (driver's wages excluded).

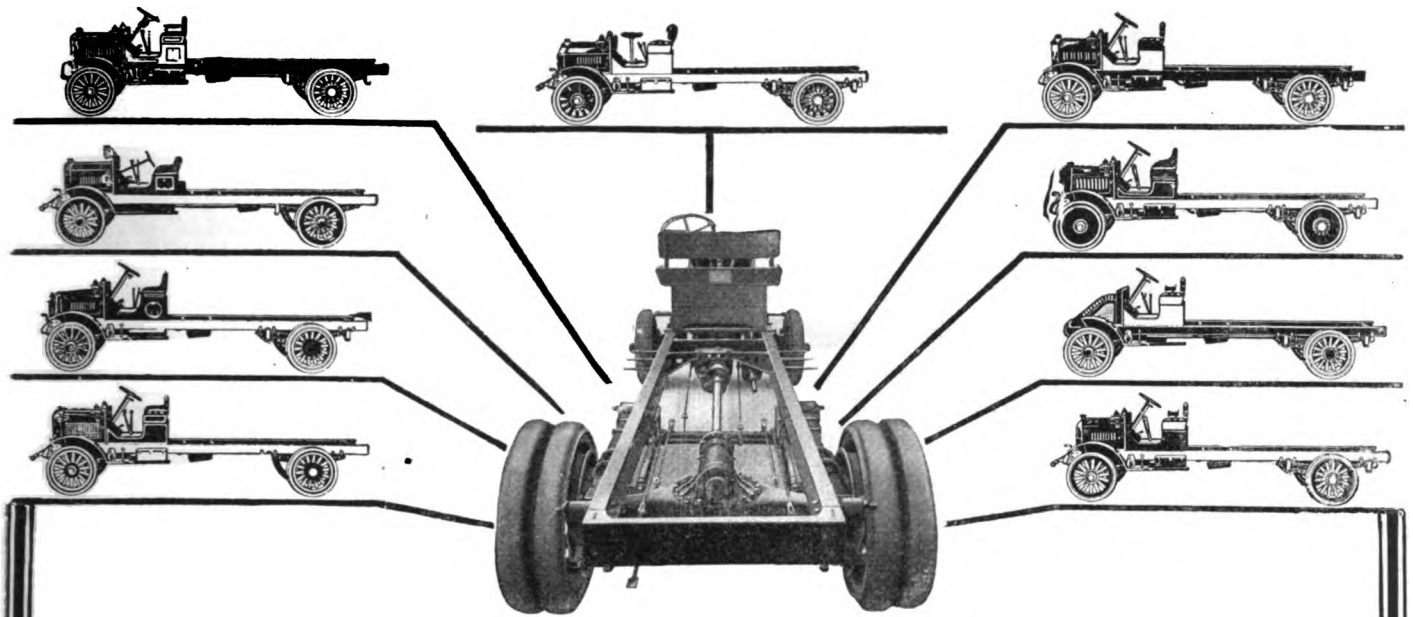
In the operation of a White Truck this avoidable expense is reduced to a minimum. It stays in active service more working days in the year than is true of any make of truck of which we have found any record.

THE WHITE COMPANY
CLEVELAND

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Service Motor Trucks

Which is the Best of the Big Ten?

Your Choice Will Determine Your Success as a Dealer

Ten big motor truck manufacturers dominate the entire truck industry. When you choose outside of these ten, you choose in a field of small sales — big sales resistance — and in a field where permanence of ownership is doubtful.

Successful motor truck dealers are confining their choice to the big ten. And out of the big ten one make must stand as excelling in enough features of design to make it first choice.

Decide on Specifications

Motor Trucks are built for service—for hard work — for economy — for durability. Your choice becomes not one of body lines, of graceful appearance, but of super-strength—super-ability—super-service.

In your selection of the motor trucks you will sell, you can base it entirely upon comparative specification — upon comparative owner endorsement. Analyze the big ten. Your choice will be SERVICE.

And back of SERVICE owner confidence—back of SERVICE super features, is SERVICE super co-operation, bringing real buyers to your sales room.

20% Super-Strength

Close comparison of SERVICE specifications with the other nine of the dominant ten show a 20% super-strength in frame, drive system, motor and all parts doing heavy work. This 20% super-strength is the result of highly specialized construction — the adapting of every SERVICE feature to the work that must be done.

SERVICE motor trucks are built and designed by truck specialists —every feature must receive the O. K. of our specialized corps of engineers before we will allow it to go into SERVICE construction.

This Wonderful Endorsement

Never, we believe, has the SERVICE sales record been duplicated. 60 per cent of 1916 sales were re-orders. 67 per cent of 1916 production were re-sales. This tremendous volume of re-order business is the most convincing testimonial that has ever been paid any motor truck. It is evidence of that kind of owner satisfaction which means: Once a SERVICE owner, always a SERVICE owner.

Exceptionally Low Price

Yet duplicating the accepted features of construction found in the most expensive trucks—adding extra features, which combined are not obtained elsewhere—SERVICE motor trucks sell for less than any of the remaining nine. Surely you will not pay more for less than SERVICE offers.

Contract NOW while these unusual prices prevail:

1-ton truck	$1375
1 1-2-ton truck	1950
2-ton truck	2250
3 1-2-ton truck	3000
3 1-2-ton truck (Special Contractor's)	3250
5-ton truck	4000

13 Point Booklet Write today for our big illustrated 13 Point Booklet and a special folder showing records of SERVICE motor trucks in your line of business.



Service Motor Truck Company

Main Office and Factory

Wabash, Indiana

Dept. V-2

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"Patent Pending"

Are used by America's leading Truck Builders

These wheels were designed by, and are built under the supervision of, experienced engineers. They have been thoroughly tested and have proved they will stand hard usage and abuse.

Over 25,000 WEST'S CAST-STEEL WHEELS are now used on trucks and not one of them has failed to give satisfaction. Specify WEST'S CAST-STEEL WHEELS on every heavy truck you buy.

SATISFACTION GUARANTEED

The West Steel Casting Company

805-815 E. 70th St. Cleveland, Ohio

"Watch the West Cast-Steel Wheels Go Round"

"WHITNEY" Chains
ARE BUILT FOR STRAINS



We have recently completed another large addition to our factory in order to be of service to our customers and are now in position to make prompt deliveries on most sizes of roller chains.

Whitney Chains are strong, accurate and dependable. They are used by the leading makers of trucks throughout the country.

Insist on "Whitney" Chains when making replacements.

The Whitney Mfg. Co.
Hartford, Conn.

Chains, Keys and Milling Machines

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1½-3-5 and 7 Ton Sizes

DOUBLE end steering device of original design makes it not only possible but EASY to back trailer anywhere. Double swiveled tongue; no other trailer has it.

Also pole, semi, and pleasure car trailers.

Detroit Trailers are used by *Cadillac, Ford, Saxon, Reo, Jeffery* and other large auto concerns who know good trailers when they see them.

MONEY FOR DEALERS

The demand for trailers is increasing rapidly as you know. An agency for a good trailer is a good thing, and an Agency for the Detroit Trailer is the best proposition in the Trailer line.

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Branch for Canadian Trade—Walkerville, Ont.

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Designing a truck presents no nicer problem than that of providing it with springs.

No concern in the world is as well prepared to solve this problem—none with the amount of experience—none with the varied experience—none with the facilities and equipment, either human or mechanical, that the Sheldon Axle and Spring Co. offers.

Collectively—these facts are the reason why the service Sheldon Springs will give is a known quantity and a guaranteed quantity.

SHELDON AXLE AND SPRING COMPANY
Wilkes-Barre, Pa.
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America's Standard Motor

Commercial Four-Cylinder Models

Model N.....3½ x 5
Model N.....3¾ x 5
Model C.....3¾ x 5¼
Model C.....4⅛ x 5¼
Model E.....4½ x 5½

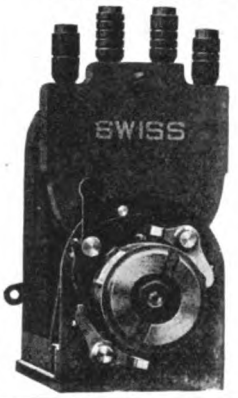


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Continental Motors

America's Finest Magneto

THE SWISS



Both at home and abroad, that is the opinion of those who know. Everywhere the Swiss is the choice of manufacturers of cars, trucks and tractors, who would rather pay a little more and have their ignition *right*, than risk their reputation with cheap, uncertain ignition.

The Swiss Safety Starting Coupling Absolutely Prevents Back-Kicks from Pre-ignition. It is the only coupling with which the impulse spring cannot interfere in the proper action of the magneto.

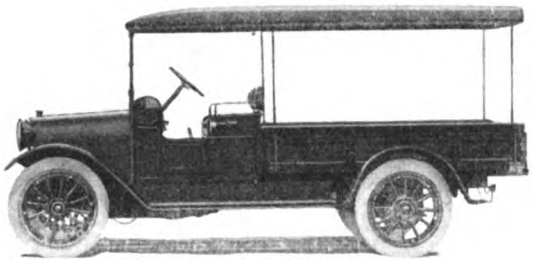
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WORCESTER MASS. WYMAN & GORDON CLEVELAND OHIO

THE TRUCK SENSATION OF THE YEAR



The new REO 1500-pound "Speed Wagon"

$1000 F.O.B. Factory

REO MOTOR TRUCK COMPANY
LANSING, MICH., U. S. A.

FRAMES

THE PARISH & BINGHAM CO
CLEVELAND OHIO

Our entire engineering force is at your disposal.

One-Ton with Three-Ton Efficiency



The MARTIN FIFTH WHEEL
makes possible this combination of a 1-ton Packard and a 3-ton Fruehauf trailer.
Write for further information
MARTIN ROCKING FIFTH WHEEL CO.
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Reasons Your Customers Can Understand

F W D TRUCKS

NEVER before has there been a truck with so many selling points, easy to explain and to demonstrate, as the F-W-D Truck. The new catalog gives you these points in plain, non-technical language. Responsible dealers will be added in open territories to take care of the increasing demand.

Write for Particulars
FOUR WHEEL DRIVE AUTO CO.
Dept. K, Clintonville, Wis.

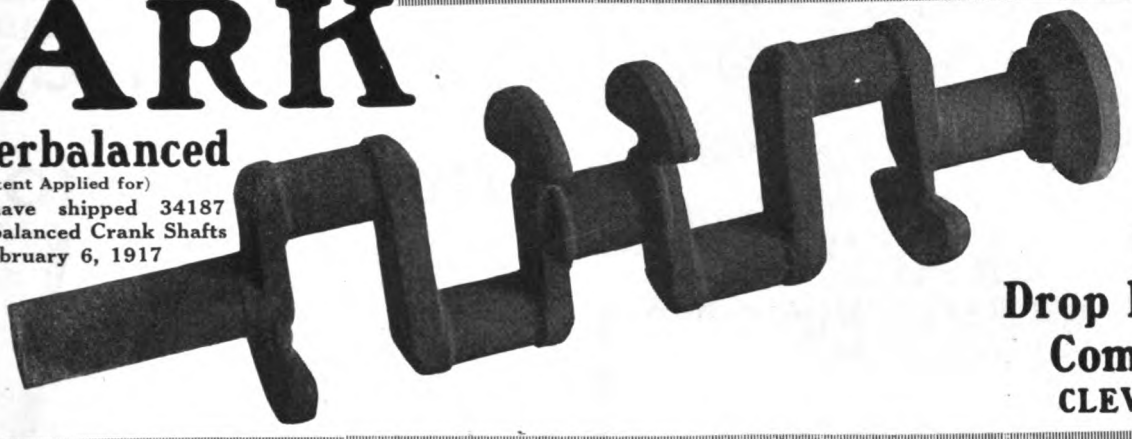
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Counterbalanced

(Patent Applied for)

We have shipped 34187 Counterbalanced Crank Shafts up to February 6, 1917

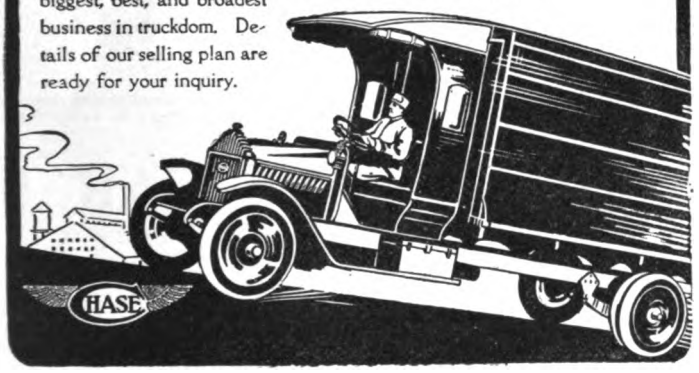


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Models from ¾ Ton to 5½ Tons. Worm Drive Exclusively.

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THOMAS TRUCKS
BUILT IN NEW YORK

The Thomas is keyed to do things a little better than the best—it has a mission beyond the ordinary. What you know about other trucks is no guide as to what your customers can expect from the Thomas.

The Two Ton **Worm Drive**

YEARS AHEAD

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"BOUND BROOK" (Graphite-and-Bronze)
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They are a species of TRUCK INSURANCE that is appealing strongly to truck makers and owners all over the country. They need no attention and outlast all other bushings.

All genuine graphited oil-less bushings have always been made at Bound Brook, U. S. A.

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Specialists in the Manufacture of Oil-Less for more than a Third of a Century
BOUND BROOK **NEW JERSEY**

Strong—Sturdy—Wonderful

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HIGH-DUTY
ONE TON TRUCK
$695

METZ COMPANY
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TRUCKS

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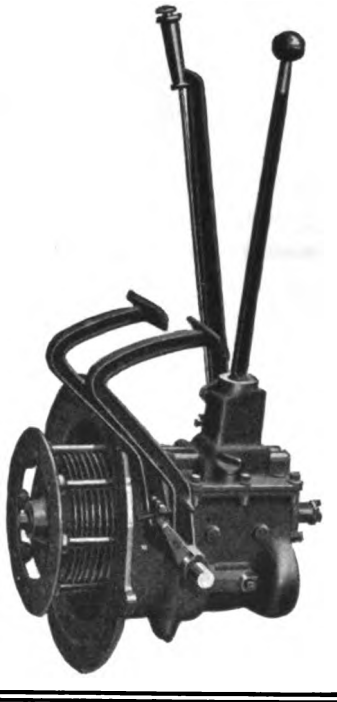
Gramm-Bernstein Motor Truck Co.
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FULLER
Unit Power TRANSMISSIONS

Model "T U" ¾-1 Ton

Model "T U 2" 1½-2 Ton 4 Sizes

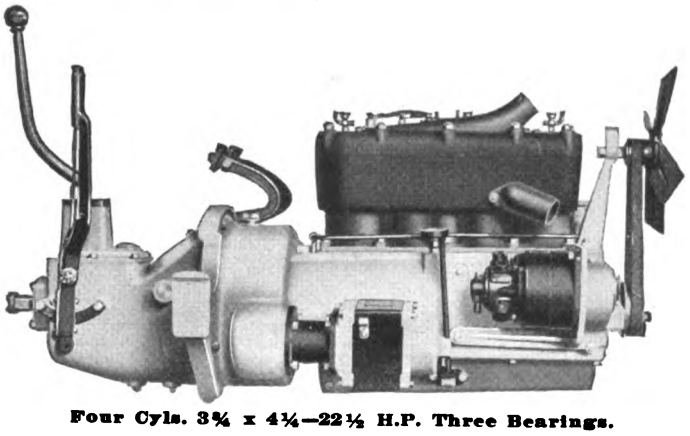
Particulars sent on request



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FULLER & SONS MFG. CO.
Kalamazoo, Mich.

G·B&S motors



Four Cyls. 3¾ x 4¼—22½ H.P. Three Bearings.

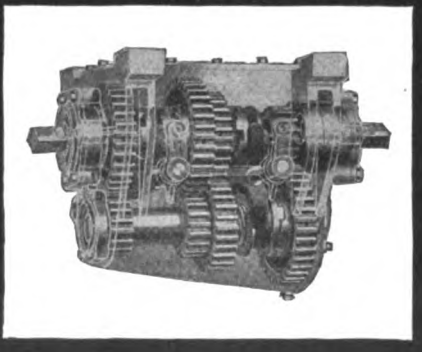
New Chain Adjustment

By a very simple but absolutely certain method the chains on the G B & S motor may quickly be taken up. This one feature indicates the continuous process of refinement that is possible in a factory which devotes its energies exclusively to the production or one type and one size of motor.

This motor has the power, the stamina and the quality that makes it supremely satisfactory in motor truck service. Write.

GOLDEN, BELKNAP & SWARTZ COMPANY
DETROIT, MICHIGAN

COTTA TRANSMISSIONS



All Gears Always in Mesh

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

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Lenox "American" Tractor



The "American" doing practical road work

SPECIAL ADVANTAGES

4-wheel drive, 4-wheel steer, light weight, extreme flexibility and unusual amount of horsepower actually delivered at the drawbar.

Catalogue and prices on request.

Manufactured by

LENOX MOTOR CAR COMPANY
BOSTON, MASS.

"Velvet Mileage"
from



GOODRICH DE LUXE TRUCK TIRES

To avoid excessive vibration truck users sometimes discard ordinary tires after they have worn down about one inch.

Goodrich **De Luxe** tires contain nearly twice as much rubber which must be worn down before they reach that point.

That's why users say they deliver "Velvet Mileage."

The B. F. Goodrich Co., Akron, Ohio

DEALERS MAKE MONEY!

Get the agency for the "Tonford" truck unit—one of the quickest selling propositions you ever tackled. Attached to a Ford chassis, makes a one-ton truck. Light, strong, economical, easily handled. Drygoods merchants, furniture dealers, retailers in almost every line, bottlers, farmers, creameries, all want it. Find it best possible buy.

$325 Tonford $325
TRADE MARK

All the facts that sell the Ford, sell the Tonford. Highest grade truck attachment made—easiest to attach—strongest, most durable. Best constructed truck unit on market—lowest priced. Get busy now, while territory is still open. Write today. Learn how "Tonford" dealers pile up profits.

DETROIT TRUCK COMPANY, Mfgs., Detroit

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It has been our endeavor to create a commercial vehicle that would excel first of all in the quality of the material used, and second, in the economy of its operation.

Our reputation for producing the most lasting truck is recognized by our many users.

We offer for your convenience the following sizes:

1½ ton 3½ ton
2 " 5 "
7 ton

HURLBURT MOTOR TRUCK COMPANY
133rd St. & Harlem River
NEW YORK, N. Y.

MACK TRUCKS
MEAN
MORE SALES PER YEAR

The New MACK "heavy duty" truck has met with immediate popularity. Careful buyers have been quick to recognize its mechanical superiorities.

The following list represents two weeks' sales of this new model:

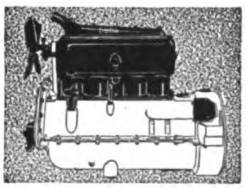
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Standard Oil Co. of New Jersey, New Jersey
Emerson Morgan Coal Co., Baltimore, Md.
Independent Ice Co., Cambridge, Mass.
Geo. Gunther Brewing Co., Baltimore, Md.
Borough Asphalt Co., Brooklyn, N. Y.
W. B. Johnson, Seymour, Conn.
Michigan Steel Casting Co., Detroit, Mich.
Edelstein Contracting Co., New York
Burns Brothers, New York
The Texas Company, Chicago, Ill.

Write for Dealer Helps

INTERNATIONAL
MOTOR COMPANY
64th St. and West End Ave.
NEW YORK

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"LET US KNOW THE FACTS"—No. 1



VOLUMETRIC EFFICIENCY

if theoretically perfect would mean filling the cylinders 100% full of fresh gas on each cycle. This target is too high to hit, of course, but the BUDA MOTOR comes exceptionally near it.

The BUDA MOTOR

has its high Volumetric Efficiency assured:

1. By surrounding the intake manifold with a hot water jacket.
2. By providing an intake manifold free from sharp bends, and smooth inside.
3. By designing and locating the valve pockets so as to offer the very least resistance to the flow of gas during both intake and exhaust strokes.
4. By using the utmost care to provide the precisely correct relation between opening and closing of intake and exhaust valves.

The BUDA MOTORS for cars, trucks and tractors bear the closest technical examination. Try it.

THE BUDA COMPANY, HARVEY (Chicago Suburb), ILL.

BUDA MOTOR

Sell Sootless

The Better Plug



SELL Sootless Plugs—because they're better Plugs.

Because their perfectly protected firing points constantly scour themselves clean.

Because their multi-wound mica insulation is far stronger than porcelain or stone.

Because their patented, exclusive construction keeps them gas-tight — oil-proof —clean.

And because Sootless Service paves the path for profits from your other lines.

Write for catalog and discounts today

THE OAKES & DOW COMPANY

Dept. "V", 15 Chardon St., Boston, Mass.

GMC

GENERAL MOTORS COMPANY

TRUCKS

This trade mark stands for a complete line of trucks *built in worm and chain drive* to meet the varied demands of city and country work—a truck to fit your business.

Send for catalogues today

GENERAL MOTORS TRUCK COMPANY

One of the Units of General Motors Co.

Pontiac, Michigan

Branches and Distributors in principal cities (84)

DESIGN

The Steering Gears that Predominate on Motor Trucks

Ross Superiority begins right here. All the bearing surface of both screw and sleeve is constantly used. This is why engineers have chosen

ROSS GEARS

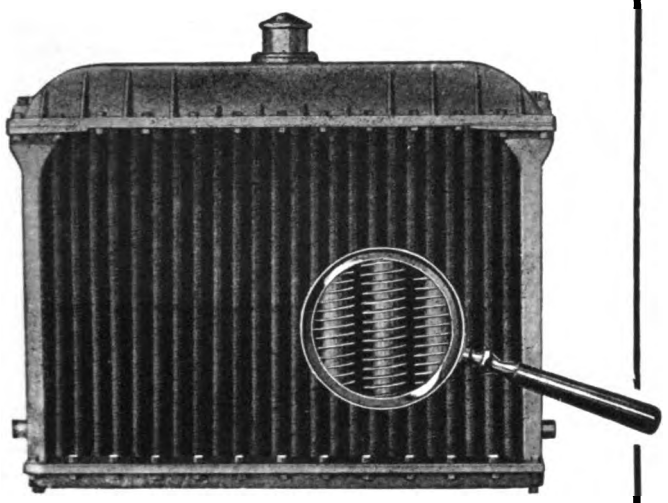
as standard equipment on 124 different makes of motor trucks. The enormous bearing surface makes Ross Gears easy to operate, with the greatest degree of safety and reliability."

Write for Catalog and further information

ROSS GEAR & TOOL CO.
750 Heath Street Lafayette, Ind.

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Seamless Copper Helical Tube Cooling Sections



Are Guaranteed for the Life of the Motor on Which They are Installed

Helical Tube Construction is Accepted as the Best by the Leading Truck Makers of America

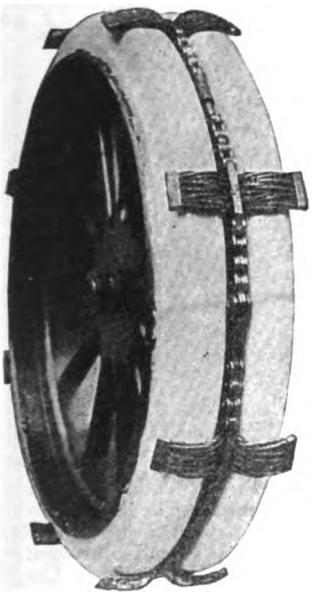
Manufactured only by

ROME-TURNEY RADIATOR CO.
ROME, NEW YORK

PIERCE

Leading Manufacturers advertise, as proof of their leadership, the presence of PIERCE GOVERNORS on their trucks.

The
PIERCE GOVERNOR COMPANY
Anderson Indiana



Don't Wait

until the streets are covered with ice and snow, before getting "NEVER-SKIDS" for your motor trucks.

THE NEW TYPE

NEVER-SKID

practically eliminates vibration

Does away with skidding and affords positive traction on slippery streets. The cross-pieces are made of the finest quality woven steel wire — **strong** enough for the heaviest machines made.

The device can be applied in a few minutes without jacking up the truck, and there is no danger of its catching in driving chains or damaging tires.

YOU WILL SURELY NEED "NEVER-SKIDS" this winter.
Why not get them now?
Folder and prices will be gladly sent

NEVER-SKID MFG. CO.
122 Liberty Street, New York, N. Y.
New England Distributer: WILLARD B. DAVIS, 39 Danforth Street, Fall River
Chicago Distributor: FRED ALLEN AUTO SUPPLY CO., 1610 S. Michigan Avenue

Standard

MADE IN DETROIT USA

Motor Trucks

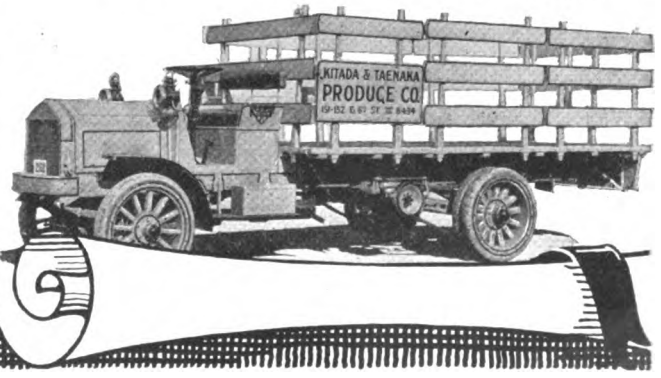
Startled the Motor Truck Industry By a Unique Sales Plan

First of all, the Standard is an unusual truck. It is a powerful combination of many of the world's best-known units—the Continental Motor; Timken Axles; Timken Bearings; Brown-Lipe Gears, and other well-known standard parts

The Standard Motor Truck is sold in an unusual way. Any responsible person can be the agent for the Standard, with absolutely *no investment—no deposit* and *no contract.*

Write for details of this plan. No obligation.

STANDARD MOTOR TRUCK CO, 315-327 Bellevue Ave. Detroit, Mich.



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ARMLEDER
Motor Trucks

A Quick Success In A New Territory

Until a few months ago, Armleder Motor Trucks were entirely unknown in the Philadelphia territory. But the trucks sold from the start when the Adler-Armleder Company, 1426 Fairmount Avenue, was formed.

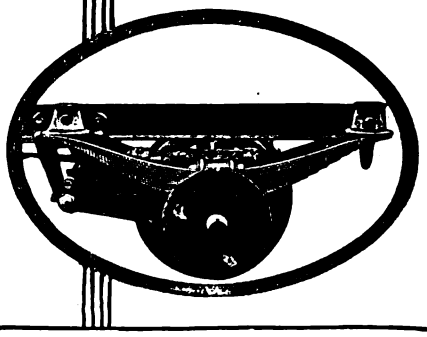
Distinctive features of design, obvious quality, made the first sales. Owners helped to sell other Armleders. Service expense has been unusually low for the dealers.

"Our profits have been so satisfactory that we have decided to abandon other lines and concentrate on trucks as exclusive Armleder dealers," says Manager C. I. Adler. "We are moving into larger quarters and are about to push the business in a big way."

There may be an Armleder opportunity like this in your territory. Write to-day for all the facts.

Two-Ton Worm Drive
Three-and-a-half-ton

The O. Armleder Co.
Twelfth, Plum & Charles Sts.
CINCINNATI, O.



Real Value

THE KREBS COMMERCIAL CAR CO. CLYDE, OHIO U.S.A.

You get the full value of your money and more when you invest in a KREBS Truck.

Guaranteed by manufacturers with 16 years' experience in motor vehicle construction, the KREBS combines Simplicity and Low Maintenance with Efficiency and Reliability.

It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault-type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

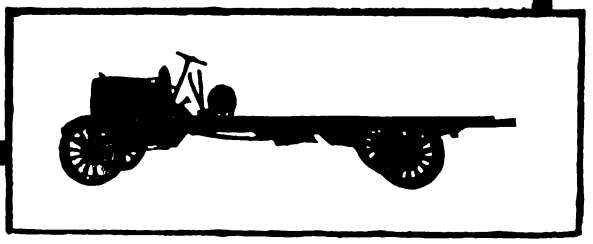
Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.

KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.

Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.



"Little Giant"



The Power-Bred Truck

MECHANICAL power is bred into the Little Giant Trucks of today—just as strength and endurance were bred into the Percherons of the past. The Little Giant is lively, responsive, like a fine-spirited horse—yet, like a young Mogul Locomotive, it is dependable twenty-four hours in twenty-four. Thousands of Little Giant owners proudly boast—"it never had a tow-rope on it yet."

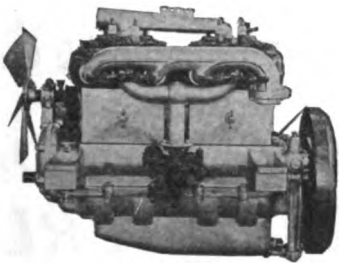
THE "LITTLE GIANT" LINE INCLUDES

Model 15—1-ton Worm Drive
Model H—1-ton Chain Drive
Model H—1½-ton Chain Drive
Model 16—2-ton Worm Drive
Special Bodies for Every Purpose

Agents wanted for desirable territory

CHICAGO PNEUMATIC TOOL COMPANY
1085 Fisher Bldg. CHICAGO — **52 Vanderbilt Ave. NEW YORK**
Branches and Service Stations Everywhere

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Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

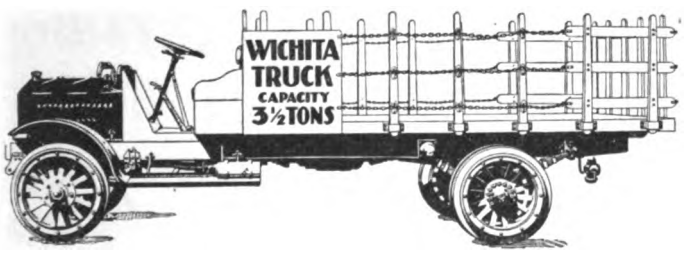
BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications.

BEAVER MFG. COMPANY

Milwaukee Wisconsin



WICHITA TRUCKS

Dependability Plus Service

We want a Dealer with energy and spirit,—we want one who will make the co-operation with him of our factory organization worth our while, and his. We want men who can interest concerns in our heavy-duty trucks and then not let up until they sell them.

If you are such a Dealer we have an interesting selling proposition that will interest you immensely.

Besides the WICHITA 3½-ton capacity truck, we have a 2½-ton and a 5-ton truck—both worm driven.

Write us for our plans.

WICHITA FALLS MOTOR COMPANY

Arthur Boulevard, Wichita Falls, Texas

WICHITA
WICHITA FALLS MOTOR COMPANY
WICHITA FALLS, TEXAS, U.S.A.

THE MARK OF A BETTER RADIATOR

G & O Radiators for Heavy Duty Service

The G & O Mfg. Co.

New Haven Connecticut

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Quality— In Quantities

The New Departure Manufacturing Company has rendered a distinct service in making possible the production of high quality ball bearings in quantities sufficient to enable American car manufacturers to meet increased production demands without sacrificing any part of standardized quality.

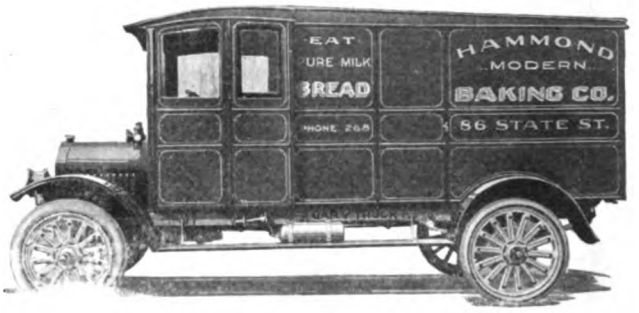
This would have been impossible without correct principles of ball bearing design; the proper steel and a perfected plant and organization for turning out rapidly ball bearings so uniform that micrometers cannot detect any difference in dimension truth nor microscopes any variation in the structural essentials of the steel.

THE NEW DEPARTURE MFG. CO
Bristol, Ct. Detroit, Mich.

NEW DEPARTURE BALL BEARINGS

AMERICAN MADE FOR AMERICAN TRADE

The
Gary Motor Truck Company
Manufacturers of
Gary Worm Drive
MOTOR TRUCKS



5 MODELS *5 CAPACITIES*

¾ Ton 1 Ton 1½ Ton 2 Ton 3 to 3½ Ton

Complete 1917 Catalog will be mailed Promptly on Request

General Offices:

GARY MOTOR TRUCK COMPANY
610 BROADWAY GARY, INDIANA

1000 Pound Capacity

Sheridan Commercial Car

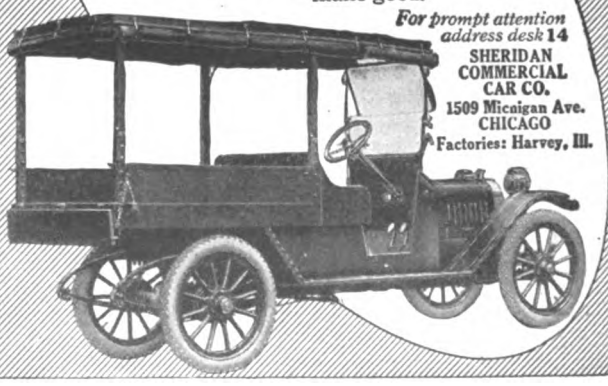
Ready for Delivery Now

Fully Equipped Price $540

THE SHERIDAN is the lowest priced delivery car on the market. Thoroughly equipped and properly built to do the work it's designed for—haul 1000 pounds any time—anywhere. Ample in size, load capacity and power.

Sells fast to a big, ready-made field of *buyers*. Not a rebuilt pleasure car. Made a truck through and through by manufacturers of trucks, to replace horses where price is what counts. Chassis alone, **$490.** Fully equipped, **$540.** Write or wire for complete details. Make territorial reservations now. Dealers make good.

For prompt attention address desk **14**
SHERIDAN COMMERCIAL CAR CO.
1509 Micaigan Ave.
CHICAGO
Factories: Harvey, Ill.



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Thermoid
HYDRAULIC COMPRESSED Brake Lining—100%

An Overturned Truck

reflects discredit on both owner and maker. However the accident may have happened, many people say: "Careless driver," or "Irresponsible owner," or "Unreliable maker."

Thermoid Brake Lining won't prevent all kinds of accidents, but it most positively will prevent all those that come from slipping brakes—brakes that fail through their lining. Here is a big source of costly accidents eliminated at trifling expense.

Thermoid will grip with friction power even when worn thin as paper. It is one single solid mass, made so by hydraulic compression. By weight it shows 50% more material than any other brake lining. That material is long-fibre Canadian asbestos spun on brass wire and impregnated with a friction compound which is also impervious to heat, water, oil, gasoline or dirt.



Cannot be burned out nor affected by oil, heat, water gasoline, dirt.

Your Guarantee

Thermoid Brake Lining is absolutely guaranteed to give more satisfactory results and to outwear any other lining manufactured. Not affected by heat, oil, water, gasoline or dirt.

Thermoid Rubber Company

Trenton, New Jersey

Makers of a full line of automobile accessories and mechanical rubber goods.

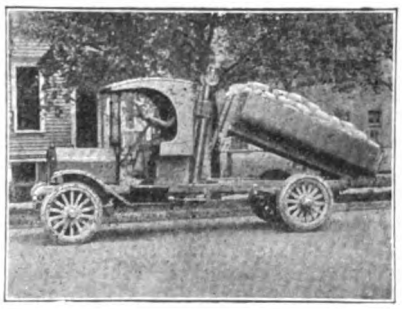
Stegeman

SIX-CYLINDER

SELF-STARTER

WORM-DRIVE

TRUCKS



The most for your money—that's what we offer. A 6-cylinder Motor, Electric-Starter and Electric-Lights are furnished on our truck without extra charge. On any other machine they would cost $300 extra.

Ours is not the cheapest truck on the market, but it is certainly a low-priced line, quality considered.

WE WANT RELIABLE AGENTS

STEGEMAN MOTOR CAR CO.
Milwaukee, Wisconsin



AUTOCARS
are equipped with the
"JASCO" TANK

Why? Because demonstrated service facts have proven that this gasoline receptacle makes fuel absolutely safe from fire or explosion and devotes every drop to energy.



"JASCO" TANKS are made of drawn steel. They are seamless, tinned and tested and positively cannot spring a leak even under the most severe conditions. They are money savers, life and property protectors. If your car is equipped with an old fashioned riveted tank you are courting danger. Investigate the "JASCO" today. Full details on request.

The "Jasco" Tank is used and indorsed by the following prominent manufacturers:

PLEASURE CARS

Biddle Motor Car Company, Simplex Automobile Company, Mercer Automobile Company, Lozier Motor Company, Stanley Motor Cariage Company, James Cunningham Son & Company, H. H. Franklin Mfg. Company.

TRUCKS

Baldwin Locomotive Works, Autocar Company, General Vehicle Company, H. G. Burford Company, Peerless Motor Car Company, Garford Motor Truck Company, Gramm Motor Truck Company, Thomas Auto Truck Company, Motor Trucks, Ltd., Canada.

JANNEY, STEINMETZ & CO.
Main Office: PHILADELPHIA
New York Office: HUDSON TERMINAL BUILDING

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Wilson

Motor Trucks

Haulage Economy

is the dominant feature of Wilson Trucks.

More ton miles per day—at less cost for operation and upkeep. This is the problem Wilson engineers have solved.

Wilson Trucks are built heavier in all important members than other trucks of the same load capacity. The tires are larger, the frame members and axles stronger, the power greater.

There are scores of features in the Wilson Truck that are showing their worth in daily performance. On a basis of efficiency and economy, the Wilson Truck demands your attention.

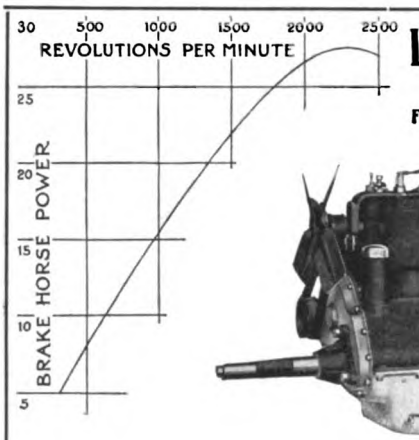
Three models—one and two tons capacity—and semi-trailers with a haulage capacity of from 3 to 5 tons.

The J. C. Wilson Co.

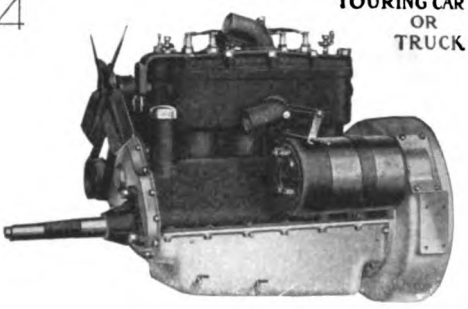
DETROIT, MICH.

DEALERS

The Wilson Truck offers you a wonderful opportunity to build up a permanent and profitable business. Some very profitable territory is now open. Write or wire, today, for our liberal dealers' policy.



LE ROI MOTOR
3⅛×4½ MODEL C
FOR THE LIGHT ROADSTER TOURING CAR OR TRUCK



Used by leading manufacturers of best-known American-made light trucks.

The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

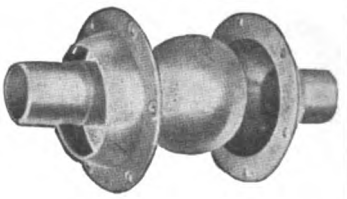
LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

CABLE LE ROI MILWAUKEE

BOSSERT

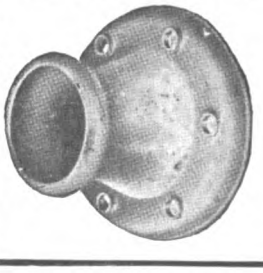


In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice.

We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



The Bossert Co.

UTICA
N. Y.

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CORLISS

Half-Ton Light Delivery Trucks Are Most Economical

The lowest cost of operation per ton-mile insures the greatest returns per dollar invested, from any motor truck.

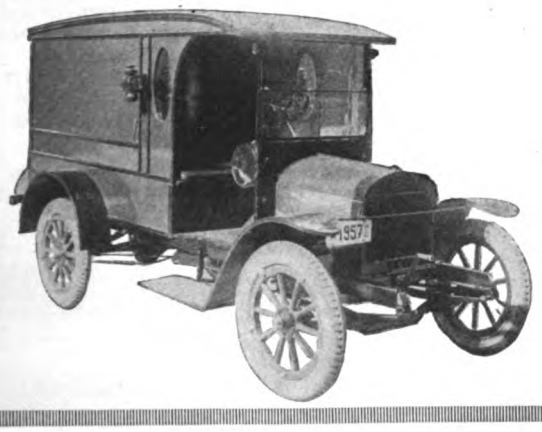
The CORLISS is the most economical truck in its price class. Carefully constructed with parts you know, including Le Roi Motor, Schebler Carburetor, Dixie Magneto, etc.

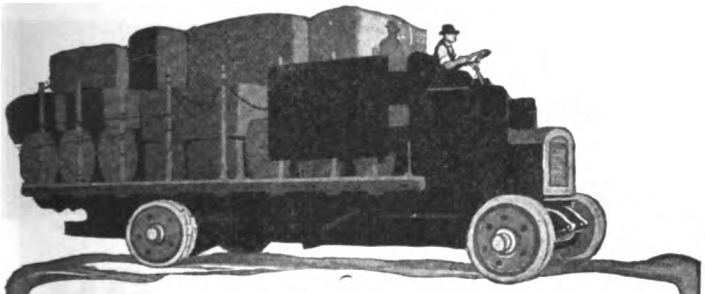
Write for catalog with complete specifications and illustrations.

Panel Body $695

CORLISS MOTOR TRUCK CO.
Corliss, Wisconsin

Express Body $675





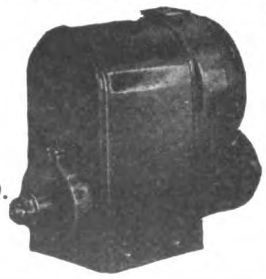
Power!

Power at low speed—power enough and to spare—that's what counts in a heavy truck. When the motor turns slowly, the compression is maximum, the mixture often too dense for an ordinary spark to penetrate. The

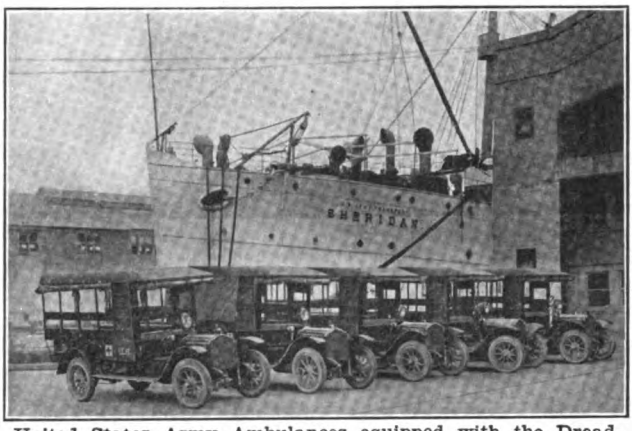
EISEMANN MAGNETO

is standard equipment on 72 different makes of trucks, largely because the manufacturers tests have shown that the intensely hot, powerful Eisemann spark penetrates the densest compression even when the motor is barely turning over!

In all, 117 manufacturers have adopted the Eisemann Magneto as standard equipment. They know its dependability, its durability, its power.



THE EISEMANN MAGNETO CO.
Sales and General Offices
32-33d St., Brooklyn, N. Y.
802 Woodward Ave., Detroit, Mich.



United States Army Ambulances equipped with the Dreadnaught

Know your mileage

Your trucks *should* cover so much ground per day. How much *do* they cover? Your fuel *should* cost so much per mile. How much *does* it cost? Your tires are *guaranteed* for *so many* miles. *How many* are you getting?

DREADNAUGHT *Indestructible* Hub Odometer

TRADE-MARK

attached to the hub, gives accurate, infallible mileage records—stops the leaks in your mileage and gets full returns from your delivery investment.

Many others are saving money with the Dreadnaught. Why not you? Investigate this easy means of saving money. Write for our free book showing the Dreadnaught and the Recordograf, a wonderful instrument that gives a detailed tape record of every move of your truck.



This is the Dreadnaught, the most accurate and reliable truck recording device made—the only hub odometer guaranteed indestructible even in collision—a new one free if you break it. It's easy to read—dustproof, greaseproof—figures always right side up.

Write for booklet and prices

AMERICAN TAXIMETER COMPANY

Mfrs. of Jones & Popp Taximeters

Broadway and 57th Street New York City

SERVICE STATIONS IN THE FOLLOWING CITIES:
San Francisco New Orleans Washington Chicago Detroit Philadelphia Seattle Boston Pittsburgh St. Louis

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DUPLEX

THE ORIGINAL

4 WHEEL DRIVE

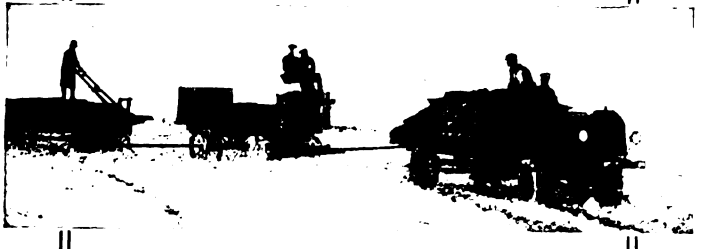
Do you want a heavy hauler that will climb an icy embankment, or pull through sand and mud up to the axles, with a 3½-ton load.

Do you want a heavy duty truck that will go and keep going where no rear-drive truck can follow? That can't be stuck as long as any one of its four wheels can find traction? That will haul two or more trailers?

Send for your copy of the new 1917 Duplex catalog. It tells why the Duplex meets your requirements. It explains in detail why the even Duplex application of power to all four wheels keeps down the fuel consumption, saves tires, and cuts repair bills to the minimum.

$1,000,000 was raised in 48 hours recently to build new plants to make more Duplexes to answer the demand from contractors, oil men, the U. S. government, mining, construction, and engineering companies. Our production has been tripled in the last two months; and will be doubled again upon the completion of new plants.

DUPLEX TRUCK COMPANY
LANSING MICHIGAN



Duplex hauling its own load and trailers on snowbound wagon trail over badly cut sand loam near Denver, at altitude of 5,000 feet



Truck Tire Efficiency

Our new, secret process compound, vulcanized under a pressure of 1,600,000 pounds (almost four times the pressure used to vulcanize ordinary truck tires) has more vitality, rugged strength and durability than any other compound manufactured.

For this reason, United States Solid Truck Tires are the strongest and most durable now on the market.

United States Tire Company
1790 Broadway, New York City

UNITED STATES RUBBER COMPANY AND ASSOCIATED COMPANIES — US RUBBER SYSTEM

Handle Your Time Sales on the

Guaranty Time Payment Plan

GUARANTY PLAN
COMMERCIAL CAR Time Payments

Guaranty Securities Corporation
Equitable Building, New York City

San Francisco
Hobart Building

Montreal
National Trust Company

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NORTH AMERICAN MOTORS

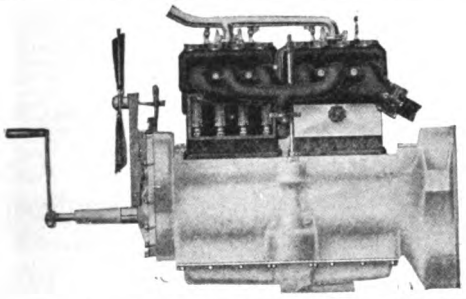
This is to announce two new models which have been added to the "N. A." line. They are: Model C, developing 20-25 H.P., and Model CX, developing 25-30 H.P.

These motors round out a line of power plants for commercial vehicles which are the most thoroughly accessible and simplest truck motors ever designed.

Full information on these new models or on our entire line will be gladly sent.

A Detroit office has been opened at 1325 Dime Savings Bank Building.

NORTH AMERICAN MOTORS COMPANY
Factory: POTTSTOWN, PA.
Detroit Office: 1325 Dime Savings Bank Bldg.



DIAMOND T

TRUCKS

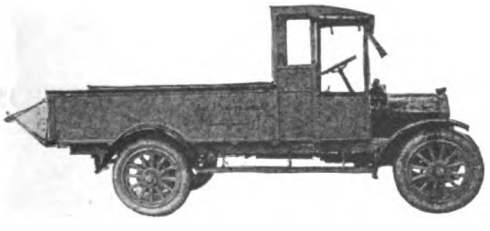
Diamond T Service is as thoroughly built into our ¾-ton trucks, the smallest of the line, as it is in our 3½ ton model.

Its low cost is made possible only by its wide popularity which has enabled us to produce this model in enormous quantities. There has been no cheapening of quality or inferior workmanship permitted in its design or construction.

For a thousand uses it is the most satisfactory and economical delivery vehicle ever marketed. With a body suited to your requirements, it will improve your delivery service while lessening your operation expense.

Write to-day for catalog.

Diamond T Motor Car Co., Chicago, Ill.

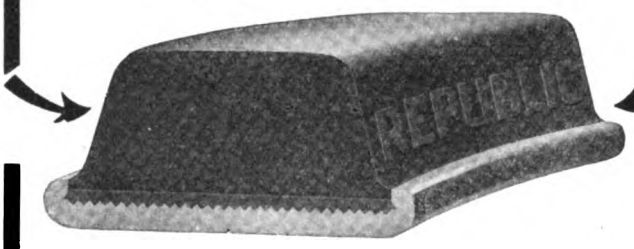


CONVINCE YOURSELF

Send for a sample of the wonderful rubber used in

REPUBLIC

PRŌDIUM TRUCK TIRES



Test it on a coarse emery wheel. The result will be a revelation to you.

It will resist this, the severest of all tests, better than any other solid tire compound on the market.

You will find, also, that it will not chip, but will wear down slowly and as smoothly as the finest steel to the very last particle.

The heat of friction will not cause it to harden and crack.

Not only does it display marvelous wear resistance, but laboratory tests show that the tensile strength of this rubber exceeds most solid tire compounds by 1000 pounds per square inch. It is unusually light in weight, insuring maximum resiliency.

You wonder what does it. The secret lies in the

Prōdium Process

discovered and used exclusively by the Republic Rubber Company.

Made in all sizes, both Channel Base pressed-on Type, and Flange or Demountable Type.

This tire possesses the supreme vitality that you want in your truck tires.

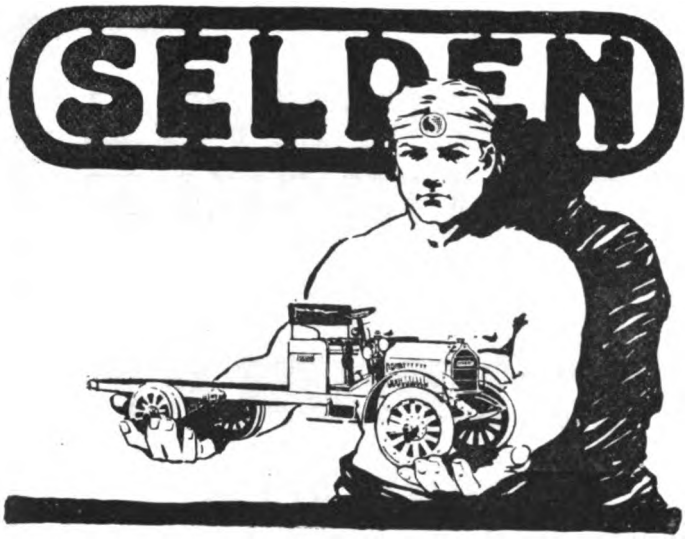
See nearest REPUBLIC Dealer, or write us for further details before you purchase another truck tire.

Manufactured by

The Republic Rubber Company
Youngstown, Ohio

Branches and Agencies in the Principal Cities

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DEALERS
Here's the Truck!

The Big New
MODEL TX
One Ton
Selden Truck

CHASSIS PRICE $1385 F.O.B. Rochester N. Y., U. S. A.

This is the truck that will sell. Think of it—a big, powerful "IN-BUILT QUALITY" truck—with a wheelbase of 140" and a frame of 9 feet 6 inches back of the driver's seat—for $1385.

Consider the massive construction of this quality job—and all parts are standard parts made from the best materials obtainable. It's the best One Ton buy on the market to-day. And there are six other equally sturdy models of ¾ Ton, 1 Ton, 2 Ton, 3½ Ton and 5 Ton capacity in the Selden complete line.

Soon Selden Territory will all be closed. Applications are pouring in fast. If you want a Selden Agency, get our Sales Proposition QUICK!

Selden Truck Sales Co.
Rochester, N. Y., U. S. A.



The More a Man Knows

about motors the higher is his opinion of the Wisconsin. In design, in materials, in workmanship, Wisconsin Consistent Motors are unexcelled. Our attention is fixed on keeping the quality up, not on speeding production up.

Write for specifications of motors for pleasure cars, trucks or tractors.

Wisconsin Motor Mfg. Co.
Sta. A. Dept. 319 Milwaukee, Wis.

New York Branch: 50 Church St.
T. M. Fennerm, Factory Representative.
Pacific Coast Distributor: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles St., Los Angeles, Cal.

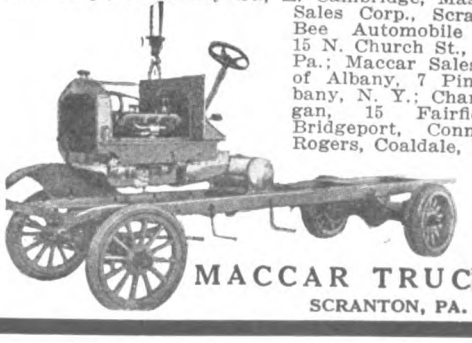
MACCAR

Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.
If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.
The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.
Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.

Distributors:

Pitts Motor Car Repair & Sales Corp., 532-40 Atlantic Ave., Brooklyn, N. Y.; Stratford Motors Co., Inc., cor. Broad and Brown Sts., Philadelphia, Pa.; R. G. Boyle, 201 Tenth St., Jersey City, N. J.; Britton-Stevens Motors Corp., 52 Binney St., E. Cambridge, Mass.; Maccar Sales Corp., Scranton, Pa.; Bee Automobile Company, 15 N. Church St., Allentown, Pa.; Maccar Sales Company of Albany, 7 Pine St., Albany, N. Y.; Charles Finnegan, 15 Fairfield Ave., Bridgeport, Conn.; E. V. Rogers, Coaldale, Pa.



MACCAR TRUCK CO.
SCRANTON, PA.

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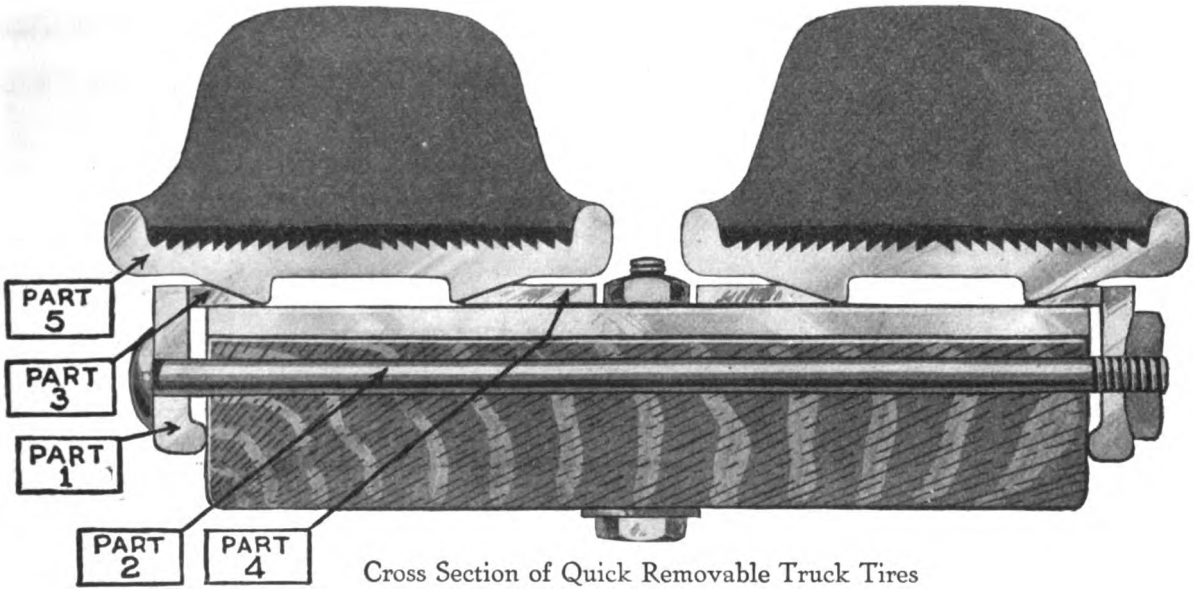
Working Efficiency

The Firestone Removable Rim, the only removable equipment which really works, occupies a dominating place in the working efficiency of many industries. For the remote mine or lumber camp, as well as for many of the special requirements of city and suburban work, the only answer is

Firestone

Quick Removable Truck Tires

No long lay-ups for tire repairs, the earning capacity of the truck multiplied, the upkeep costs decreased. Extra volume and extra quality of rubber for maximum resiliency, Most Miles per Dollar per truck. Extra toughness of rubber with extra volume, Most Miles per Dollar per tire. Read detailed notes of construction and let us send you a trained Firestone man to study your particular requirements.



Cross Section of Quick Removable Truck Tires

Part 1 SIDE CLAMPING FLANGE; continuous; holds wedge ring in place. Cannot be forced out of contact by any blow on rim as it is a separate part, fully protected from all side thrust. An exclusive Firestone feature.

Part 2 FASTENING NUTS AND BOLTS. Convex inner surface of the nuts draws up to concave surface of the flange. Practically a ball and socket joint. Ordinary brace wrench may be used to remove nut. Bolts are of standard carriage bolt dimensions, heat treated.

Part 3 WEDGE RING. The locking feature. Wedge ring seats and holds rim immovably. Wedge ring projects beyond felloe band, thus absorbing variations or inaccuracies in wheel.

Part 4 STOP PLATE is applied to S. A. E. band, fitting a corresponding key way in the tire rim. This relieves the wedge ring of excess strain in starting and stopping and prevents circumferential slipping.

Part 5 UPTURNED SIDES protect union between hard and soft rubber. Takes impact of blows from curbs or stones on rough roads. Distributes their force over wide area of felloe and spokes eliminating damage.

FIRESTONE TIRE AND RUBBER COMPANY

Akron, Ohio Branches and Dealers Everywhere

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LONG

AS CONSTANT AS NIAGARA

for

MOTOR CARS MOTOR TRUCKS AND TRACTORS



Long Cooling Systems perform a greater service and give greater assurance of perfect radiation than you can reasonably expect of the common radiator. Each Long Cooling System for each motor is designed to order. Each step in creating the design is taken in co-operation with the Engineering Departments of our factory and those of the manufacturer. Proper design insures proper construction. By reason of this co-operation, we attain minimum cost and maximum efficiency.

LONG MFG. CO.
DETROIT, MICH.

Pioneer Makers of Gasoline Engine Cooling Systems

Announcing

INDIAN TIRES

for TRUCKS

The Guarantee — The guarantee that accompanies an Indian Tire of course covers as great a distance as that of any other tire made. But we do not expect to sell Indian Tires merely on the big mileage shown in the guarantee.

The Big Mileage — The big mileage is built into the Indian Tire by men who have proved their ability by building, for others, some of the farthest traveling heavy duty tires made.

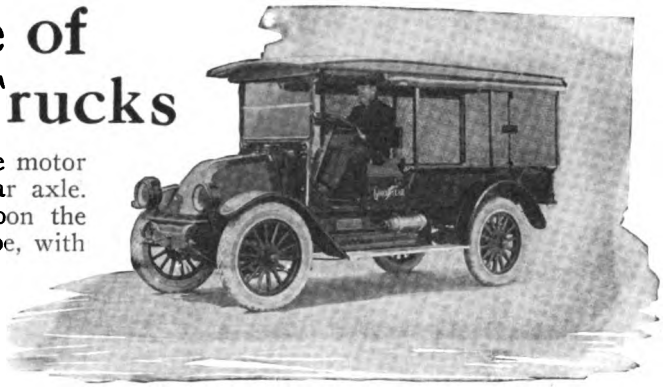
Long Experience — Long experience, with leading makers of truck tires, has equipped the designers and builders of the Indian Tire with the knowledge and skill necessary for building tires of the highest possible character.

Extremely High Quality — The extremely high quality of the Indian Tire will soon be a matter of common knowledge. It is of a character to command attention—to win respect and confidence.

INDIAN TIRE & RUBBER COMPANY
New Brunswick New Jersey

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A Service Feature of International Motor Trucks



EXCEPT perhaps the engine, no single part of the motor truck you buy deserves closer study than the rear axle. The useful life of the truck depends largely upon the behavior of this important member. The one piece type, with chain drive, has the advantages of strength and lightness. The shaft drive has the advantages of neatness, silence, and protection of the drive gears. The *International* rear axle combines the advantages of both types and does away with their disadvantages.

A heavy one-piece forging carries the load. A shaft drive delivers the power of the motor to the rear wheels through an internal gear. The axle is as strong as a chain drive axle, yet is much lighter than the usual shaft drive type, and gives more road clearance. The internal spur gear, also, outwears every other form of drive, and is the one that behaves best if your driver should ever be careless about oiling it.

The rear axle is only one of many first-class features of *International Motor Trucks*. We want your order, but we want it only on the basis that an International Motor Truck will give you better service and prove to be a better investment than any other truck you can buy. Write and tell us which of these two models comes nearest to your requirements, and we will send you complete description.

Model H—1500 lbs. capacity, chassis, $1225 cash f.o.b. factory
Model F—2000 lbs. capacity, chassis, $1500 cash f.o.b. factory

International Harvester Company of America

(INCORPORATED)

88 Harvester Building **Chicago U S A**

LAMSON TRUCKS.

A Definite Value Ask a User

5 Popular Sizes—1-1½-2½-3½ and 5 Ton

We are actually manufacturing all sizes listed and prepared for prompt deliveries.

A model for practically every business requirement—at reasonable prices consistent only with the highest grade material, parts and workmanship.

These Specifications Tell the Story

GENERAL SPECIFICATIONS

Uniform in All Sizes

Motor—Wisconsin, 4 cylinder, long stroke.
Springs—Semi-elliptic. Steering Gear—Ross.
Axles—Sheldon. Tires—Optional.
Clutch—Borg & Beck. Transmission—Cotta.
Carbureter—Stromberg.
Gas Supply—Seamless steel tank with Stewart Vacuum System.
Ignition—Dual—Bosch Magneto and Atwater Kent Unisparker.
Governor—Duplex. Electric Lights—Vesta System.

Correspondence Solicited with Live Dealers and Distributors

Lamson Truck & Tractor Co.
4644 W. Madison Street, Chicago

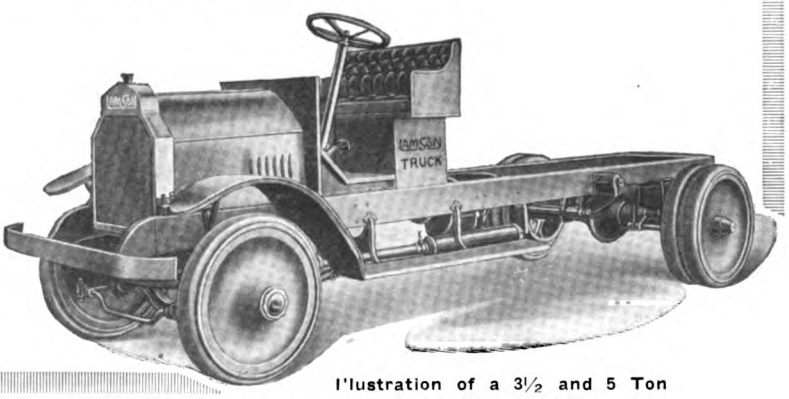


Illustration of a 3½ and 5 Ton

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STOP!

Pushing Slow Selling Lines

These Prices

$1375 $1985 $3185

Are Right

LOOK!

At Real Value

1-Ton, 2-Ton, 3½-Ton Capacity

Internal Gear or Worm Drive

LISTEN!

To Selling Reasons That Sell

The GLOBE Truck

Is An Established Big Seller

Motor car dealers don't need to pioneer with GLOBE Trucks—they are nationally known, nationally used, and nationally advertised. Built to meet the requirements of every kind of business. Over-sized where there is over-strain. Always more than able to make good.

Backed by unsurpassed service—traveling factory experts, intensive sales co-operation, semi-monthly dealer bulletins—every selling help we are able to devise.

GLOBE specifications talk for sales. It's easy for dealers to close them.

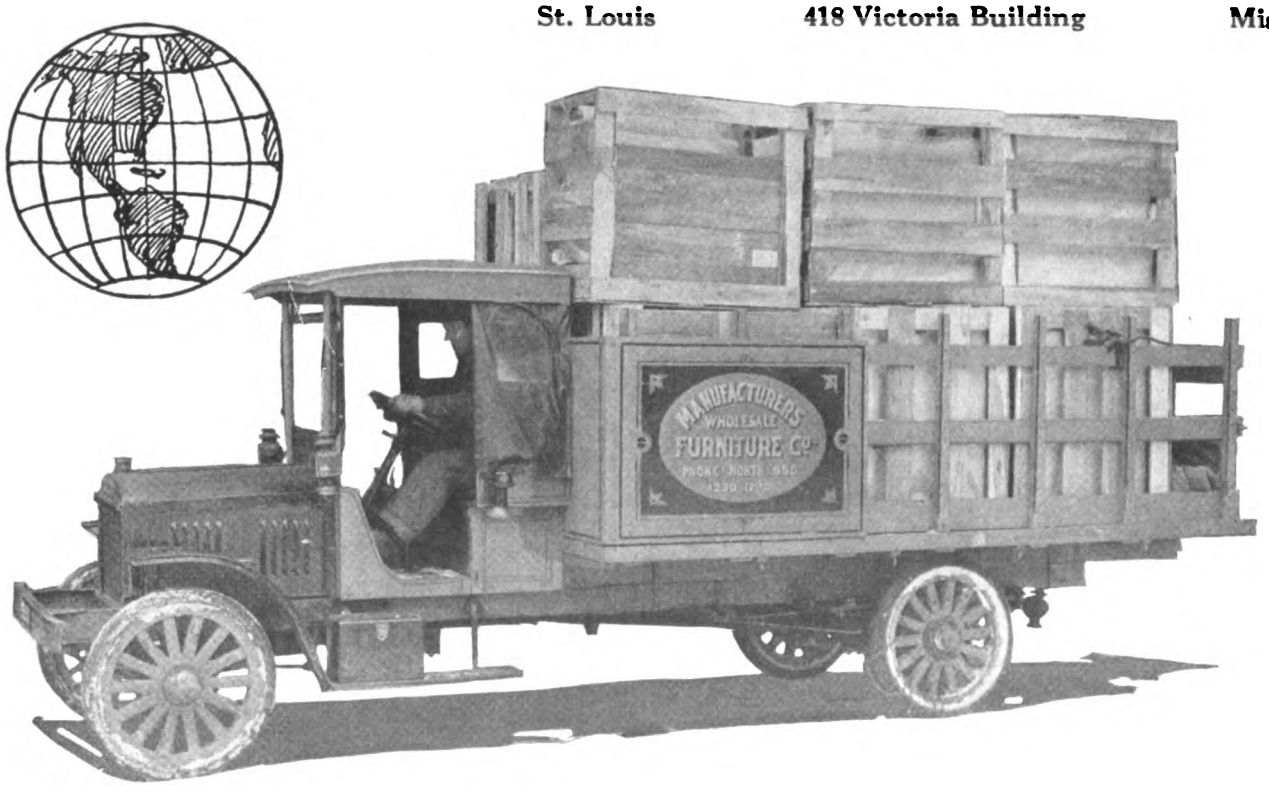
SPECIFICATIONS

Motor—Continental.
Carburetor—Master.
Ignition—Elsmann.
Clutch—Multiple dry disc.
Transmission—Selective, 3 forward speeds and reverse. Left drive. Center control.
Drive—Internal or worm gear.
Front Axle—Drop forged I-beam.
Rear Axle—Internal Gear, Celfor. Worm Gear, Timken.
Front Springs—Semi-elliptic.
Rear Springs—Semi-elliptic.
Wheels—Artillery type.
Frame—Special carbon channel steel.
Wheel Base—136 in. Tread 56 in.
Colors—Standard, Coach green with lemon-yellow striping.
Gasoline Capacity—16 gals.

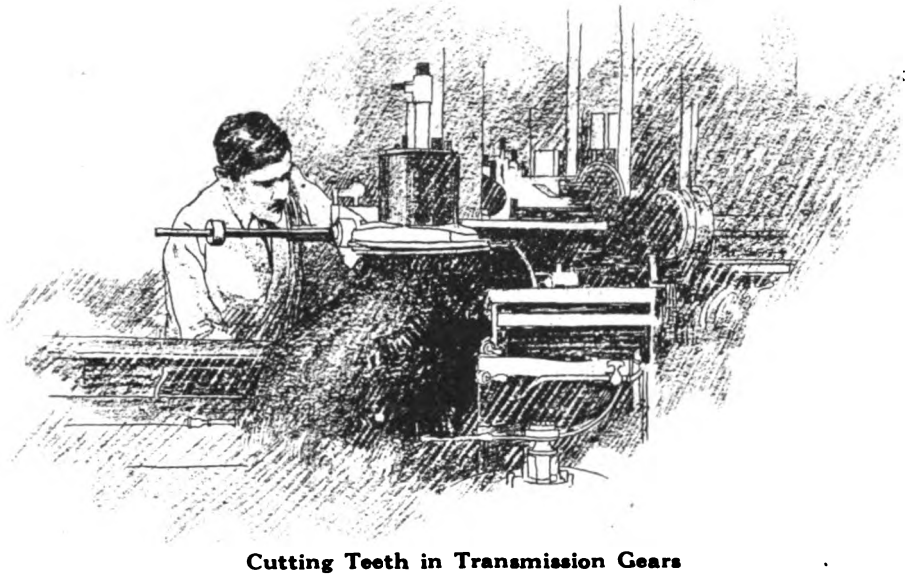
Get into the truck field right. Rich with prospects and profits. GLOBE Trucks satisfy. *They sell. Write for free illustrated literature and our liberal offer to dealers.*

GLOBE MOTOR TRUCK CO.

St. Louis 418 Victoria Building Missouri



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Cutting Teeth in Transmission Gears

BROWN-LIPE

THIS PICTURE ILLUSTRATES the strong sense of responsibility that is felt by every worker—from the highest to the lowest—in the Brown-Lipe employ.

THIS MAN KNOWS that only one grade of work is expected of him—the most skilful, painstaking, and highest quality of which he is capable.

HE ALSO KNOWS that this work will be checked, re-checked, and thoroughly inspected, after leaving his hands.

THERE ARE NO BROWN-LIPE "SECONDS." Every Transmission or differential bearing the Brown-Lipe or Brown-Lipe-Chapin name is of the highest quality that human skill and modern machinery can produce.

BROWN-LIPE GEAR COMPANY

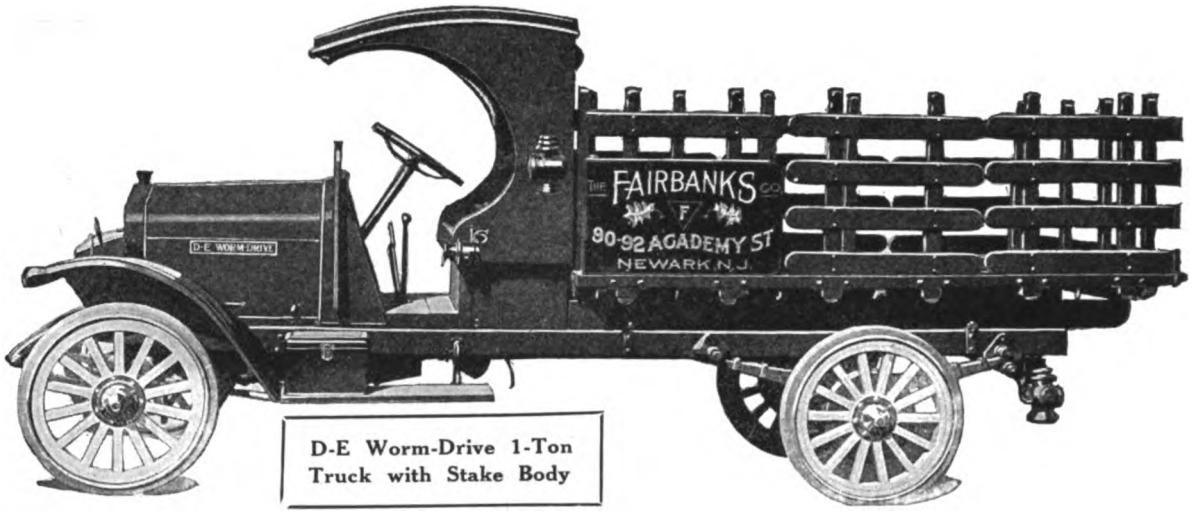
SYRACUSE Transmissions NEW YORK

BROWN-LIPE CHAPIN COMPANY
Differentials

NEW YORK: Thos. J. Wetzel, 29 West 42d Street
SAN FRANCISCO: A. H. Coates, 444 Market Street

FOREIGN AGENT
Benjamin Whittaker, 2 Norfolk Street, Strand, London, W. C.

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D-E Worm-Drive 1-Ton Truck with Stake Body

D-E WORM DRIVE MOTOR TRUCKS

¾-Ton $975—1-Ton $1250—1½-Tons $1500—2½-Tons $2000

D-E Worm-Drive Motor Trucks are built on the theory that if the best a man can do is no better than another man can do, the best thing he can do is quit.

We have put into D-E Worm-Drive Motor Trucks so much more *value* than any other trucks at their prices, that to tell the simple truth about them may sound like an overstatement. But go over them from radiator to rear axle, and your practised eye will tell you that there is not another Worm-Drive truck proposition in America to compare with the D-E. They fairly bristle with selling arguments—sales-clinching features.

Before you make a decision to take on a line of motor trucks, write or wire us for complete specifications and dealer proposition, and we will warrant that you will be quick to decide in favor of the D-E Worm-Drive line—for the profit-making possibilities are simply irresistible. Write or wire TODAY.

DAY-ELDER MOTORS CORP. D WORM DRIVE E NEWARK N.J. U.S.A.

GENERAL SALES OFFICES:
1451 Broadway, New York
P. K. HEXTER, Sales Manager

DAY-ELDER MOTORS CORP.
Manufacturers of
D-E WORM-DRIVE MOTOR TRUCKS
NEWARK NEW JERSEY, U. S. A.

"BUILT AND SOLD FOR EVERLASTING SERVICE"

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THE WINTHER

affords the first and only complete line of American-made, heavy duty internal gear motor trucks—built by master builders—ready for faultless service in whatever degree.

4 Models
3,000 to 12,000 Pounds

Model 47—1½ to 2-ton
Maximum, 4,000 Pounds.

Model 67—2½ to 3-ton
Maximum, 6,000 Pounds.

Model 87—3½ to 4-ton
Maximum, 8,000 Pounds.

Model 127—5 to 6-ton
Maximum, 12,000 Pounds.

Produced in four models and eight capacities — capable, durable, dependable. They blanket their field.

Prominent in the specifications of the **Winther,** are its Internal Gear Drive, Locking Differentials, Drop Forged Axles, Timken Bearings, Four-Bearing Crank Shaft, Force Feed Oiling, Optional Wheelbases, Variable Frame Lengths, 3½% Nickel Gears, Constant Mesh Transmission, Vanadium Steel Springs, etc.

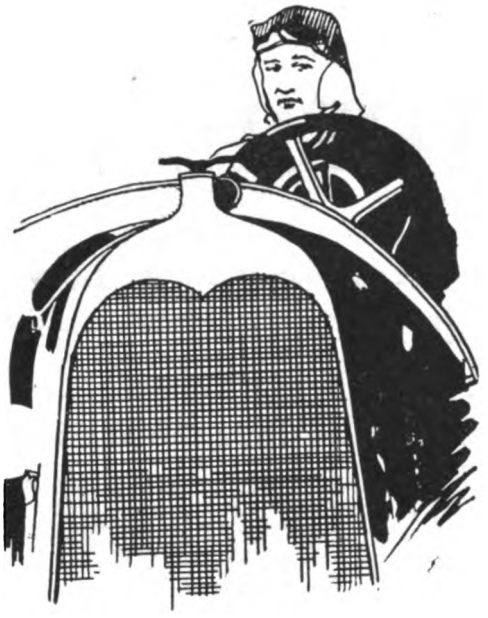
We have a liberal distributors' offer for a few well-organized and well-financed dealers.

The Winther Motor Truck Company

Kenosha, Wisconsin

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VICTORIES



Nothing demonstrates the position of FEDDERS Radiators in the American automobile game more clearly than the results of the races. Taking the racing results since mid-summer, we want to call your attention to the performance of cars equipped with

FEDDERS RADIATORS

Here is a résumé of the Fedders racing record for 1916.

Thirteen "firsts" out of twenty-seven officially sanctioned events. Forty-two "places" finished—and no Fedders-Equipt car was delayed at any time or forced to withdraw on account of cooling trouble.

1916 FEDDERS VICTORIES

CONEY ISLAND CUP RACE, 20 MILES, NEW YORK, MAY 13.

Car and Driver	Finish
Maxwell—Rickenbacher	4
Maxwell—Henderson	5

METROPOLITAN TROPHY RACE, 150 MILES, NEW YORK, MAY 13

Maxwell—Rickenbacher	

INDIANAPOLIS INTERNATIONAL SWEEPSTAKES, 300 MILES, MAY 30

Maxwell—Henderson	6
Premier—Wilcox	7

DES MOINES 150-MILE RACE, JUNE 24

Maxwell—Henderson	2
Maxwell—Rickenbacher	3
Stutz—Cooper	5

SIOUX CITY 10-MILE RACE, JULY 8

Premier—Wilcox	4

SIOUX CITY 20-MILE RACE, JULY 8

Premier—Wilcox	1

SIOUX CITY 50-MILE RACE, JULY 8

Premier—Wilcox	1

OMAHA 50-MILE RACE, JULY 15

Maxwell—Rickenbacher	2
Maxwell—Henderson	3

OMAHA 150-MILE RACE, JULY 15

Maxwell—Henderson	4

TACOMA MONTAMARATHON, 300 MILES, AUG. 5

Maxwell—Rickenbacher	1
Maxwell—Henderson	5

CINCINNATI DERBY, 300 MILES, SEPT. 4

Peugeot—Aitken	1

INDIANAPOLIS 20-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Wilcox	2

INDIANAPOLIS 50-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Lewis	5

INDIANAPOLIS 100-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Lewis	5
Maxwell—Henderson	7

ASTOR CUP RACE, 250 MILES, NEW YORK, SEPT. 30

Peugeot—Aitken	1
Maxwell—Rickenbacher	2

GRAND AMERICAN, 250 MILES, CHICAGO, OCT. 14

Peugeot—Resta	1
Peugeot—Aitken	2
Maxwell—Rickenbacher	3
Premier—Lewis	4
Maxwell—Henderson	5
Premier—Galvin	6

HARKNESS TROPHY RACE, 100 MILES, NEW YORK

Peugeot—Aitken	1
Premier—Galvin	2
Peugeot—Wilcox	3
Maxwell—Henderson	4

VANDERBILT CUP RACE, 294 MILES, SANTA MONICA, CAL., NOV. 16

Peugeot—Resta	1
Stutz—Cooper	2

GRAND PRIZE RACE, 403 MILES, SANTA MONICA, CAL., NOV. 18

Peugeot—Aitken-Wilcox	1
Stutz—Cooper	2

ASCOT DERBY, 150-MILES, LOS ANGELES, CAL., NOV. 30

Stutz—Cooper	2

UNIVERSAL TROPHY RACE, 112 MILES, UNIONTOWN, PA.

Premier—Lewis	2

This showing proves that the FEDDERS is still in its place as the foremost American Radiator.

FEDDERS MANUFACTURING CO., INC.
BUFFALO, N. Y.

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Traffic FEDERAL News

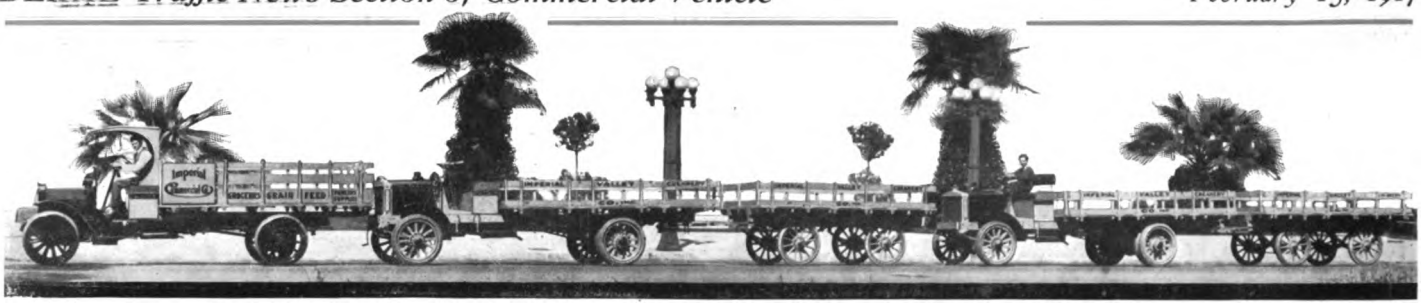
FEBRUARY, 15-1917.



This Edition 30,000

FEDERALS EVERYWHERE

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California Leads in Motor Truck Users

A Very Interesting Article About the Coast Conditions of the Commercial Car Market

By P. S. Nichols of the Pacific Kissel Kar Branch

FIGURING the actual number of motor trucks is use relative to business houses in existence and private owners working in varied lines of trade, we believe that statistics show California leading all other states of the Union

That the FEDERAL has played a very important part in the progressiveness of California merchants, is a wonderful credit to the Federal Motor Truck Co., their method of business and the goods which they produce.

In California we find conditions extremely varied—perhaps more so than in any other territory of like size in the world, and some of which conditions tend to tax a truck to its utmost.

In the Sierra Nevada Mountains, for instance, there are approximately fifty FEDERAL motor trucks in use and a number of these working under government mail contracts, which require guaranteed service. It would tax one's imagination quite a little to picture a motor truck displacing fifteen



This FEDERAL Distributes Road Signs

horses, but in the very severe mountain districts of California this is a commonplace occurrence, and one FEDERAL truck operating from Keddie to Westwood is doing the same work that formerly required thirty-five horses, and doing this work in much less time. Another FEDERAL truck operating in Trinity County, from Redding to Weaverville, is displacing a similar number of horses and doing the work much more efficiently.

In the very high altitude of the Sierra Nevada Mountains, all methods of transportation cease during two or three months of the year, at which time it is not unusual to have a snow fall of eight or ten feet on the level.



Aiding in Work of Restocking Streams

This means that when the Spring opens road conditions are anything but good, and many FEDERAL owners tell us of their trucks operating in hub-deep mud and overcoming other obstacles almost unbelievable.

To give you an idea of how varied conditions may be in a limited area, will say that in



Citrus Fruit Companies Use FEDERALS

Nevada County oranges are grown at the lower altitude and in the higher altitudes which constitute part of the Sierra Nevada Mountains, there are thousands of tons of ice harvested every year. Extending to the other extreme, California has thousands of acres of desert land, some of which is very productive, and we all know of the famous Imperial Valley, from which the earliest cantaloupes and watermelons come to supply the eastern markets. In these low lands, during the summer time, temperatures of 120° in the shade are not infrequent, and many FEDERAL trucks are operating in the Imperial Valley without the least tendency of heating



Carries Supplies to Grass Valley Mines

troubles, as is also the case in the mountains, where a truck requires not only an efficient cooling system, but well designed, large brakes, powerful motor, and all parts of equally sturdy construction.

The greatest credit to a motor truck's stability can be found thru the tendency of Federal owners to repeat. In the Sierra Nevada Mountains, for instance, we have had many cases of repeat orders and have supplied many trucks to owners who had experienced difficulty with competitive equipment.

Considering the large variety of trade in which motor trucks are used, and from all the information we can obtain on the subject, we do not believe that California has an equal, and to bear out our contention in this respect will quote a few of the unusual trades in which FEDERALS are reducing operating costs in this "Presidentially" popular state.

The City of San Francisco uses one FEDERAL as a dog wagon and has saved the Society for the Prevention of Cruelty to Animals many dollars by its efficient work. This society is also operating a special FEDERAL horse ambulance, which is used for the conveyance of sick and crippled horses to a special hospital provided for the purpose. Aside from municipal service, we find a FEDERAL truck in use by the Pacific Coast Glass Co., one truck in use by the California Automobile Assn., for the distribution of road signs thruout the northern part of the State; several FEDERAL trucks in use by the State Highway Commission for the improvement of roads, also by the Fish and Game Commission to further the interests of sportsmen;



A Regular Grocery Store for Sonora County

FEDERAL truck operating near Sacramento, hauling asparagus exclusively; four FEDERAL trucks working in the Sierra Nevada Mountains, hauling special lumber clamps and provisions to the Sugar Pine Lumber Mills, these mills being situated in the heart of thousands of sugar pine trees from which best building lumber is obtained; one FEDERAL truck is used in Sonora County as a traveling merchandise store carrying provisions and supplies for sale to the different mines located in that territory; one FEDERAL truck is operated by the Western Casket Co., of Oakland, distributing caskets to the different funeral directors: the first FEDERAL truck ever sold on the coast in use by



Working for Improvement of State Roads

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A Load of Ladders From Watervliet, N. Y.



Celery in Chicago—A FEDERAL Full

FEDERALS

Chosen From Many Photographs Received Recently



A Utah FEDERAL Loaded with Shingles



This California FEDERAL Hauls Asparagus



Fuel for Residents of Salt Lake City

Pictures of Your FEDERALS Will be Printed in TRAFFIC NEWS If You Will Send Them



Carlisle's Coal is Delivered to Springfield, Mass., Users in a FEDERAL



An Albany, N. Y. Commission Firm Uses the FEDERAL For Fruit Delivery

California Leads in Motor Truck Users

(*Continued from opposite page*)

the Pacific Carbonic Gas Co., Oakland, for the distribution of recharged carbonic steel bottles, all of these in addition to trucks used in every ordinary line of trade, including the vast wine industry and grape vineyards of California and the well known citrus and deciduous fruit orchards located in different parts of the state.

Devoting part of this communication to the business methods of the Pacific Kissel Kar Branch (and we do not wish these statements to convey a feeling of egotism on their part) this company has perhaps the most progressive sales policy of any in the west—they believe strongly in advertising. "SERVICE FIRST" is their motto and a one price policy is adhered to very religiously. The FEDERAL truck has been handled by this company ever since its manufacture, and during the period of its distribution on the coast, the FEDERAL truck, thru the efforts of the Pacific Kissel Kar Branch, has fallen into the hands of well known and well established sub-dealers in their respective localities.

Selling FEDERAL trucks is like selling any other good commodity capable of improving business methods, but it should be borne in mind that every owner should be made to feel that he is entering into a co-partnership with the company from which he makes his purchase and that it is to his interest not only to take care of his equipment but to interest himself in furthering sales as far as he can do so without working a detriment to his own trade, all of which would call for better service on the distributor's part, and mutually beneficial results all around.

As a concluding paragraph of this rather lengthy article, we may state truthfully that one may travel in the state of California from one end to the other, converse with hundreds of FEDERAL owners and will not find one that is dissatisfied.



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Following Mountain Trails With a FEDERAL



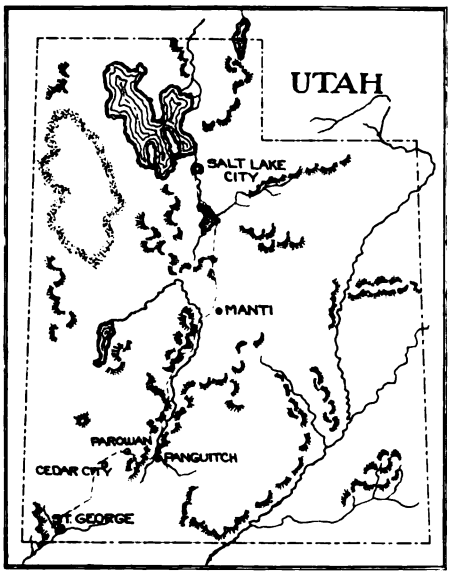
Being the Story of An Eight Hundred Mile Hunting Trip in the Scenic New and Mountainous Area in the State of Utah—Full of Adventure

REPORTS from the latest hunting trip for big game came from the White-Savage Motor Co., of Salt Lake City, Utah. In writing up the trip, Mr. White told of receiving a report from the southwestern corner of the state, that an unusually fine specimen of game had been sighted and that a fine bounty had been offered for its capture.

Being something of an enthusiast at hunting, the idea to try for the bounty took possession of him and on December 6th he set out with his friend, Mr. Houston, to the point where the game had been sighted. This was near St. George, a distance of nearly 350 miles, The road was to be over the mountains and as the thermometer registered at zero, a long, cold trip was ahead.

These men, besides being hunters, are also distributors of FEDERAL Trucks and, knowing considerable about their dependability, decided to make the trip with one of the one and one-half ton jobs that stood in their show room.

The trip down proved a very interesting one, for the country was a very picturesque one as the cuts show. These were made from pictures they took on the trip. Game



Map of the Trip Showing the Route Traversed in Red—Notice that the Journey was Almost Wholly Through Mountain Country

of all kinds proved plentiful along the way, but was not molested on this trip. Notes, however, were made of points where they were sighted, for all along the route seemed to be many good run-ways for game. These run-ways were all the way from 50 to 150 miles long.

As had been anticipated, a great deal of snow and wind was encountered along the route. Before they were away from home two days, the wind-shield, which they were using to keep out a little of the cold, had been blown in. The snow and mountain roads made going rather slow. The steep climbs between Panquitch and Parowan were very good tests for FEDERAL stamina. Between these points only 35 miles were covered in a day.

The incidents accompanying some of the climbs were very exciting. The rear wheels of the truck were wrapped with a big set of log chains, but even these with a load of cobble-stones dug from the snow were not enough to give climbing traction to the FEDERAL.

A one-inch rope, part of the outfit,



There was a Drop of Several Thousand Feet at This Sharp Turn in The Trail



Cobble-stone Dug from the Snow Were Carried Here

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proved the necessary help and with this wrapped around the wheels, over the chains, the climb was made without further difficulty. Before they started this mountain climb, several men who had failed with their pleasure cars said it was impossible. White says, "Nothing in the way of roads is impossible to a FEDERAL."

People who live in sections of the country where the land surface is rolling or flat, cannot fully appreciate road conditions in country such as was traversed with the FEDERAL by Messrs. White and Houston on this trip.

Further, the most of us would not care to assume the labor involved in any excursion among the Rocky trails of the Sierras. Often times during this trip the hunters were compelled to roll big boulders out of the narrow trail before the truck could make a passage. Then came long stretches of smooth, hard trail with a sharp incline upward with no purchase for traction. When this happened it was necessary to gather baskets full of cobblestones to load on the truck to gain traction and so climb by inches to a better road.

The trip down was accomplished with men and equipment in fine shape. Nearly forty good specimens of game were sighted, but on account of the heavy snow, often three feet deep, none could be taken at this period of the year. Messrs. White and Houston, after getting well acquainted with the run-ways, decided to return home and go again into the hunting ground early in the spring.

This plan having been adopted, they left St. George on Wednesday, December 13th, at noon and arrived at Salt Lake City Friday night. The return trip of 350 miles was made in two and one-half days without a hitch.



Sometimes Big Boulders Had to Be Rolled Out of the Trail Before the Hunting Party Could Proceed

Federal Divides With Its Employes

THE FEDERAL success is more than just the name.

The success of the FEDERAL MOTOR TRUCK COMPANY is the result of satisfaction delivered to FEDERAL users. This success as you know has been primarily the result of the perseverence and indomitable energy of the Vice President and General Manager, Mr. Martin L. Pulcher, who was also the founder of the FEDERAL Company.

At Christmas time the members of the immediate FEDERAL family here in the factory gathered together for a little informal luncheon and Christmas party.

In the course of the gathering, Mr. Pulcher, in a little talk to the employees who were gathered together, stated that the FEDERAL Company had been fortunate during the past year and that he believed that its success was not due to any one member of the organization—that the co-operative spirit and the general interest taken by the different members of the FEDERAL Family had all contributed to the fruits of the labor.

It, was, therefore, the desire of the Directors and himself that each employee who had been in the continuous employ of the Company for one year prior to December 23rd, should receive as a bonus 10% of his or her yearly salary.

Then, instead of distributing the bonus to the various persons who were to share in same, in cash, the company took its stand as an exponent of thrift by distributing bank books with the amount deposited to his or her name in the savings bank.

In giving out the books Mr. Pulcher stated that it was the desire of the company that everyone think of the future and if possible leave the money in the bank to provide for the rainy days which are liable to come to everyone.

It is significant of the esteem with which Mr. Pulcher's wishes are regarded that this plan has been invariably followed.

When Railroads Fail—FEDERALS Deliver Themselves

THE importance of delivering trucks has been brought forcibly to the front during the past few weeks since car shortage has menaced shippers. Selling itself is helpless if delivery is paralyzed. It is even more—sales would soon become an impossibility if delivery also was stopped.

As possession is nine points of the law, so is delivery nine points of collection. Sales without collection is bankruptcy, while collection without sale is impossible. During the present car shortage, extreme methods sometimes have to be adopted to make deliveries. The Federal Motor Truck Company, intent on delivery, use some of these methods in delivering their product—motor trucks.

On three recent dates, trucks have been driven 150 to 200 miles in order to make necessary deliveries. Three are shown just as they are about to leave for Indianapolis, Indiana, a long two hundred mile drive. These young men had an advantage over the others shown, in that they had protecting hoods and the weather was mild.

When the two left for Cleveland, the other day, the young men who drove had anything but a pleasant task before them. The thermometer was pointing its fingers at zero and the wind, not satisfied with the low temperature, was helping in the shaving ordeal. The old adage "It never rains but it pours," had a new meaning to them.

Again we are reminded of the importance of drivers. Trucks without drivers are like ships without rudders. Driving trucks, whether for their delivery or the delivery of commercial products, is a legitimate trade that is bound to increase in value as the motor truck is used in the bigger way of the future.



Overland Ho! Trekking to the Hoosier State with a FEDERAL Fleet



These Hardy Men Left the Factory with the Weather at Zero

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Traffic FEDERAL News

Published in the interest of
ECONOMICAL TRANSPORTATION
by the
FEDERAL
MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

Edited by: SIDNEY S. MERITHEW : L. B. DUDLEY

If You Overburden Yourself

You Suffer; Likewise, Nature's Laws Apply to the Materials in Haulage Equipment

THE coming of every commercial benefit has brought with it some sting of abuse, which either destroyed the benefit entirely or had to be overcome that the benefit might continue to exist. Even history in all its forms bears out this statement by illustrations innumerable. A very few come to mind to prove the statement.

Slavery, a benefit to some at first, was accompanied by a growing lawlessness for other's rights. The original idea of union gradually vanished and in the end a war was needed to banish the lawlessness and this war restored human rights but banished the benefit.

Telephones—to us today an indispensable benefit—brought with them the possibility of the listener. This inquisitive, unemployed sneak has always tried the nerves and patience of the respectable subscribers. The individual line with its higher rate has been the compelled result to those desiring to do private business by phone.

The wireless telegraph came with its wonderful service but it was accompanied with the other instrument somewhere tuned to it, which was sapping its efficiency.

The automobile—one of modern business, greatest friends, has the blot of the road hog on its history. Parking laws, license and other regulations come because of the relation of another factor to this modern help.

One other,—a recently added benefit, is the motor truck. This one, too, is frequently overshadowed by an enemy to its efficiency, which appeared on the scene almost as soon as did the truck. The propelling motive back of all these related factors, which hinder our modern conveniences, is the human element. The great hindrance to the motor truck, which we want to consider at this time, we can call the Overload Curse.

The Human Element

This necessary part of all motor truck operations, the human factor, must stand responsible for every evil resulting from over loads. This factor may include the designer and the manufacturer. It does include the salesman, the owner and the driver. To fasten the right proportion of this responsibility to these different parties is a task equal to a government "leak" probe. It will be beneficial to look at some phases of the problem.

Most human nature can be led, but much human nature refuses to be driven. This is a function more generally found in machines. Modern business is beginning to appreciate at this belated hour, that it has been spending altogether too much energy on competition and too little on co-operation. In well-regulated, thoughtful co-operation lies the cure for most evils.

The task of securing the co-operation of designers and manufacturers will be a simple one, if we can regulate the salesman, the owner and the driver.

Designing and Building

The different roads traveled, the wide variety of loads with their equal number of different bodies, speed and tire relations, all demand that the designer allow a factor of safety. This makes the overload possible. The ideal condition would be to design each truck for its particular work, but any such plan would make its price prohibitive. To overcome this condition, the factor of safety (safety first in design) enters into such parts of the truck as are subject to excessive, variable loads. The amount of this depends on the particular part and its importance.

Experience has taught the designer the factor to allow and today the manufacturer is building a truck evolved from that experience. This truck has combined in it the factors of safety in its different parts, which will meet all ordinary conditions. True, mistakes have been made and without doubt will be made, but we believe in an ever decreasing number. This will be but the result of the pressure of competition. Herein lies the value of competition. But competition does other things.

The Salesman's Part

Salesmen, like other humans, are not all alike. Often driven by a combination of the competition from without and the sales manager's pressure from within, they intentionally or not advocate truck operation that is all but impossible for the truck. Efficient salesmanship does not consist in advocating 3 or 5 ton loads for any 2 ton truck. What a truck will stand is one question. What it ought to stand is another more important question, which has been decided by the designer and manufacturer.

Satisfied customers are among the best of salesmen although not acting in that capacity. Let regular salesmen develop customer salesmen. If a bonus is given, let a portion of it represent satisfied customers, who have operated their trucks one year or more. This at least will stop some misrepresentation.

Analyzing The Needs

Too often the overload curse has come as a result of too little consideration to the actual need. The salesman cannot always be an engineer and the prospective buyer seldom is. Greater care should be exercised in choosing a truck. It must be adapted to its work if it is to make good.

Let the prospective study his problem. He can at least co-operate with the engineers, which the larger truck makers are now providing. Careless co-operation, however, is not the solution. It must be of an equal quality to that sought. Only by this can we expect results. If a salesman or engineer is asked to give definite data from the buyer's guesses, the buyer has no reason for a kick if the result is unsatisfactory.

The Driver Problem

There is still another partner in this transportation firm.

He may be given a truck perfect in design, carefully built, adequately suited to the work and still by his shortsightedness make a mess of the whole. He may not have the co-operation of the owner. He may be asked or even compelled to do with his truck more than it should stand. He should know the truck he drives. All the skill of the designer and manufacturer can not take the place of the brains and judgment which should be exercised by the salesman, the owner and the driver.

What share of the profits resulting from careful driving comes to the driver? What assurance has he that his job is safe tomorrow? What do any savings he makes amount to him? Most drivers, if given a share in profits, would earn them. Make the driver feel that his growing efficiency will be met not only by a need for greater results, but increased recognition of those results and he will respond.

Reasonable care by owners and drivers of FEDERALS have produced records in which the actual repairs were only one-tenth of the estimated repairs. These owners are completely satisfied and the results were obtained by reasonable treatment of their trucks.



Moving the Calendar with a Federal

It requires an event to affect the calendar, but the one and one-half ton FEDERAL is looking for these hard jobs. The Stone Printing Co. wanted a calendar job moved to one of their customers. The transfer company was called up.

The Pitzer Transfer Company of Roanoke, Virginia, were soon on the job with their FEDERAL No. 3537 and the calendars they moved with that truck will keep a large town making dates for a whole year.

When in transportation trouble, call up the FEDERAL. It is a dependable aid like the Police or Fire Department.

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FEDERAL Drivers' Page

"In honestly striving for a creditable performance you dignify your work and your daily accomplishments become a permanent record that can be pointed to with pride"

FEDERALS and FEDERAL Records Help Packers

Geo. A. Hormel & Co. Advocate the use of the FEDERAL System of Economical Haulage and a Record of Its Work

ADAPTED to your business—that is the plan of the Federal Motor Truck Co. They have devised a system by which each truck put in service can be studied and its performance improved in its particular environment.

This plan is carefully outlined to every purchaser and the service, which is gratis, is given wherever co-operation can be had.



Among the firms who accept this service and cooperate in working out the details are many large industries, as well as individual users. The progressive packing firm of Geo. A. Hormel & Co., having branches in St. Paul, Minneapolis, Duluth and San Antonio, is among the first class of Federal users, who believe in Daily Service Records.

From a letter, Oct. 2, 1916.

"These Daily Service Records are to our mind a very good form and we do not know of any way that we might improve upon them, as they seem to give all the information necessary to the proper handling of trucks, at least in our business."

This opinion from this company was not quickly formed, but is given after they had been sending in service records for five months. During that time the gasoline efficiency had been improved over 5 per cent on FEDERAL No. 3301 and over 20 per cent on FEDERAL No. 3615. The ton and one-half FEDERAL 3301 is operating in Austin and No. 3615 of the same capacity is in St. Paul.

Success is Contagious

By this time the value of records, by which the work of trucks could be analyzed, was so obvious that records were started on the ton and one-half FEDERAL No. 4047 operated in San Antonio, Texas, and driven by Luther Winters. J. McQuade, who drove FEDERAL No. 4123 in Austin, Minnesota, also became interested and started records.

These records have been received and analyzed up to December 1st, 1916, and show that Mr. McQuade has increased his gasoline efficiency 3 per cent and Mr. Winters has shown a 7 per cent improvement.

Standing Time

This very important item has more effect on economic truck operation than many owners and drivers realize. The drivers on all of Geo. A. Hormel & Co. FEDERALS reporting at the present time have made very notable reductions in the standing time during their trips. The saving in minutes is shown here to give them due credit.

Truck No.	Per Day	Per Trip
4047	31	13
4123	8	3
3301	46	13
3615	5	1

This record does not show up the driver of 3615 as well as the rest, but there is another side to his record. Since June his route has



been lengthened from 3.8 miles to 5.5 miles and his deliveries have increased from 19 to 28. Even under these conditions, he has saved one minute per trip. When, however, his saving is figured from the basis of his old route, he has saved 4 minutes on each of his five trips, which gives him a credit of 20 minutes per day.

November's Report

Days in service	85
Trips	285
Deliveries	2031
Total loads in lbs.	519851
Miles traveled	1985

Daily Summary

Deliveries	95
Total loads in lbs.	24324
Average load in lbs.	1752
Miles per gal. of gas	6.15
Miles per pint of oil	26.6
Average cost per day	$5.21
Average cost per delivery	.17

If we are to seek the most efficient service, one thing in these records should be carefully studied. The average load carried was 1752 pounds, while the truck's capacity was 3000 pounds. If it was possible to so arrange the routes or deliveries, so that the truck would carry nearly its capacity load, the cost per ton delivered could be reduced nearly 42 per cent.

Present Relations

(From a recent letter).

"We certainly appreciate very much the service you are giving us on the monthly reports made out for us. We are using these to the very best possible advantage and are taking up with each driver every item covered by the report, asking them to co-operate with us and you in making a better showing for all trucks."

Needless to say, we appreciate the co-operation of this company and its drivers, but upon this basis will the success of the motor truck be built.



The Advertising of Hormel & Co. Extends to Their Buildings and Their Trucks. They Both Reflect Neatness.

E. D. Jones Moves to Alabama - - Still in FEDERAL Family

E. D. Jones, who has been District Sales Manager with the Federal Motor Truck Company for the past six years and was previously to that with the Thompson Auto Company of Detroit, is leaving the FEDERAL organization to become associated with the Birmingham Motor Company of Birmingham, Ala. Mr. Jones will have charge of their territory sales of the Hupp, Dodge, Hudson and FEDERAL.

As Mr. Jones is well and favorably known by many people both in and out of the FEDERAL organization, we take this way of joining his many friends in wishing him success in his new connection.

We also are glad to know that with the change he does not stop selling FEDERALS, but is still directly connected with the Sales Department of the Federal Motor Truck Company.

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What Fire Chiefs Say About Federals

Nampa, Idaho—G. T. Mayhew, Chief.

We had a chance recently to test the FEDERAL to its limit and it made good. In going to a fire on a ranch one and one-half miles from No. 1 house, we ran into a newly graded lane. The road looked good but one front wheel sunk to the hub and I thought we were hopelessly stuck. With six men on and 1500 feet of hose our weight was about 8700 pounds. A ditch with four feet of water lay two feet to one side, mire on the other, and we could not back up.

Stopping the engine, we got the front wheels straight and then gave her the "juice." Although it was inch by inch, she never stopped and we rode out. All who saw it had thought is impossible.

The upkeep of our three horses and apparatus was $90.00 per month. With the car it it about $3.00, a saving of $87.00. The driver never drove a car before but has had no trouble because the FEDERAL is so simple. With reasonable care it will last a life time.

Attleboro, Mass.—H. A. Packard, Chief.

Chief H. A. Packard, of the Attleboro, Mass., Fire Department, says a heavier truck would have been a useless expense.

"Our apparatus is used in a village away from the center of our town. It does not have a very heavy fire duty. A large heavy truck would have been a useless extra expense."

Bremerton, Washington—R. G. Cook, Sect'y.

From a letter dated August 5th, 1916.

"Upon October 11th, 1915, a motor driven Combination Chemical and Hose Truck arrived in the city and upon the purchase being completed it was installed into active duty at the City Hall Station, and has borne out the experience of other cities by having improved the general efficiency of the Department out of all proportion to the initial cost, and at a greatly reduced cost for maintenance.

"During the two months that the Motor Truck has been in service it has been run approximately 150 miles, upon our worst streets and hardest hills, and carrying unusual loads so that the Department might acquire a positive knowledge of what could be depended upon under various conditions; and it has given good satisfaction, without showing any failure.

"The cost for consumable supplies used, consisting of gasoline, cylinder oil, differential oil, cup grease, etc., has been less than four dollars ($4.00).

"The Motor Truck has shown greater speed than that drawn by horses, thus increasing the radius of activity; and where the horses were played out after one run the motor can continue all day if necessary."

Littleton, Colo.—W. S. Shellabayer, Sec.

We are very proud of our truck. We know we have a machine that will go any place that any other will go and we also know that it will last as long as any of them. We will gladly demonstrate the truck to anyone at any time or will give all the information that we can by letter.

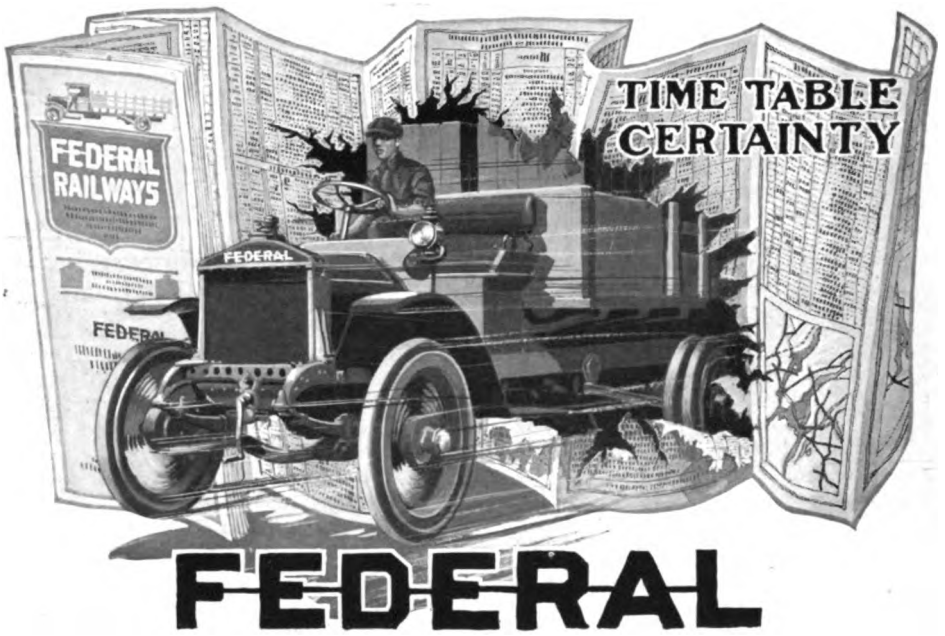
The body of the truck cost about $600.00 and other apparatus, including ladders, hose, hand chemical, axes, etc. about $1200.00 and we are fully convinced that it will do just as good work as many of the high priced machines.

Anyone desiring to get more information about our FEDERAL apparatus may write to J. E. Maloney, Mayor of town of Littleton, or to C. E. Stephenson, Chief of Littleton Hose Co.

Our Fire Dept. is a volunteer department consisting of 30 members and they are, to the man, boosters of the FEDERAL truck.

Lynn, Mass.—Edw. E. Chase, Chief Engineer.

The six FEDERAL motor trucks which we had from you and had equipped with hose bodies for use in the Lynn Fire Department, since January, 1914, are giving us the best of satisfaction, and we have had very little trouble with any of them.



FEDERAL

Assures Schedule Service

Continuous, reliable haulage is more than a matter of service to James Riha, trucking contractor of Chicago. It's a case of Contract.

Under the direction of a dispatcher, timed to the minute, Riha's FEDERALS make a round trip every hour from the Sears-Roebuck warehouse to the Sears-Roebuck plant.

In the course of a day, a two ton FEDERAL carries 35,000 lbs. of merchandise, travels 41 miles, and works on a schedule that does not allow more than five minutes leeway.

SEARS-ROEBUCK TRUCK RAILROAD SCHEDULE

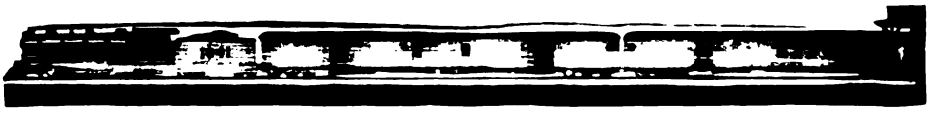
Truck No.		1	2	3	4
Warehouse	Arr.	7:30	7:45	8:00	8:15
"	Lve.	7:45	8:00	8:15	8:30
Plant	Arr.	8:00	8:15	8:30	8:45
"	Lve.	8:15	8:30	8:45	9:00
Warehouse		8:30	8:45	9:00	9:15

NOTE—These four trucks on a 15 minute headway make a round trip every hour.

FEDERAL Motor Trucks will reduce **your** delivery problem also to "time table certainty." You can schedule their operation, hour by hour—twenty-four hours a day if need be—confident that FEDERAL stamina will meet your severest needs—the unexpected emergency as well as the daily grind.

Write today for the "FEDERAL Blue Book of Traffic"—also "FEDERAL Traffic News"—Better still—let our Traffic Engineers show you how FEDERALS will meet your needs by the records they have made for other men in your own line of business.

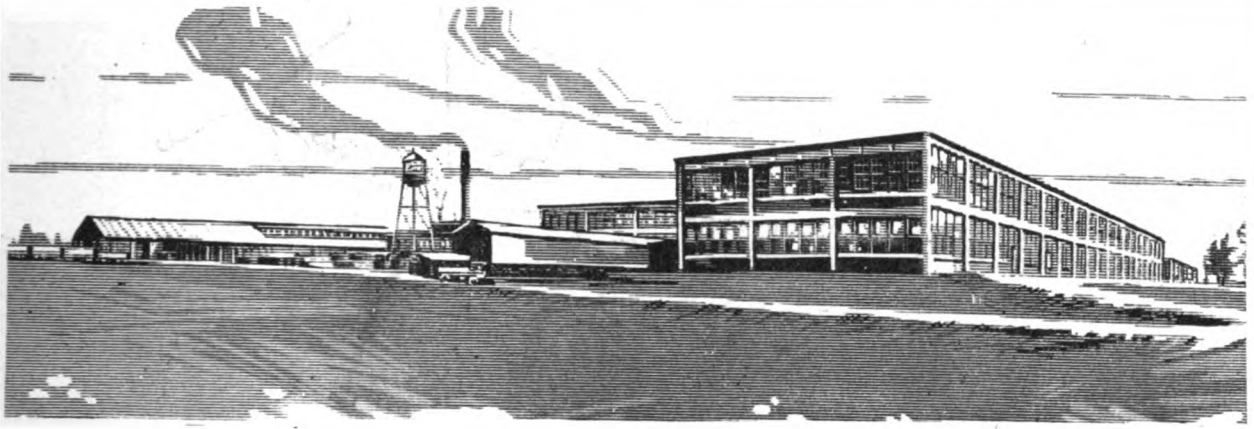
FEDERAL MOTOR TRUCK COMPANY
DETROIT, MICHIGAN



Certainty of Getting the Goods Delivered on time is one of the Chief Factors in Modern Delivery. The above FEDERAL advertisement, which appears in the leading publications in March, shows that the Federal will keep on Schedule for you. Nearly six million people will see this Advertisement.

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Leaders For Ten Years



Our 1916 business exceeded our expectations. Our present production will double during 1917. The Garford factory is already the largest plant in the world devoted exclusively to the manufacture of a complete line of motor trucks.

FOR a full decade The Garford has been a leader in the manufacture of motor trucks.

Every effort, every resource has been concentrated on that one purpose.

We have made a searching study of traffic conditions in all parts of the country.

We know what is required of a motor truck—and we have built a line of trucks that will meet those requirements—squarely, dependably and economically.

Garford Motor Trucks are perfectly adapted in design, power, strength and capacity to meet the most exacting demands of *any* business—no matter how large or how small it may be.

And this wonderful group of motor trucks has established an enviable reputation and a tremendous success for Garford.

Dealers are sharing in Garford success through the selling of Garford Motor Trucks.

If you too are interested, we have an attractive proposition to offer.

Write Dept. 103 for complete information

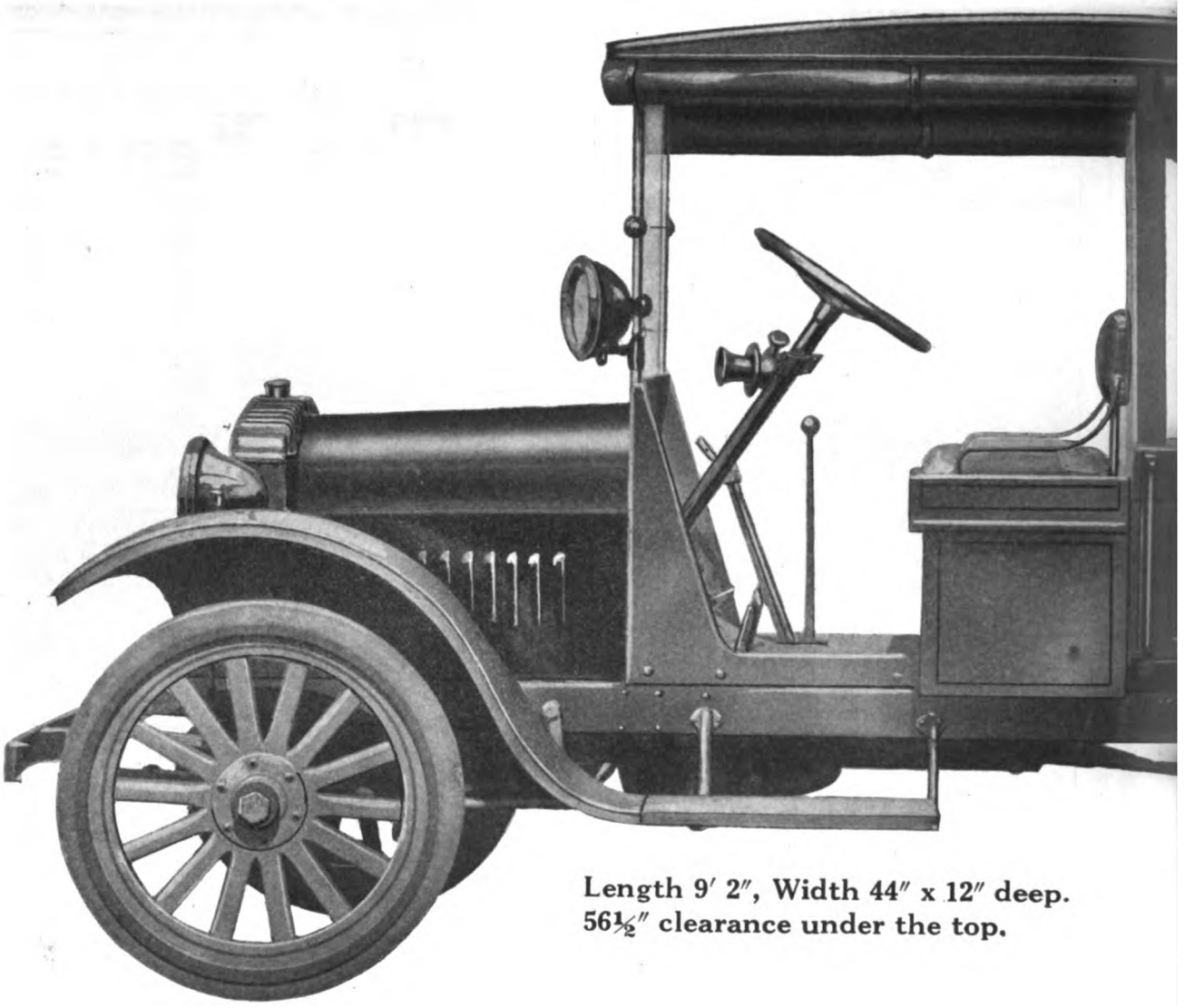
Garford MOTOR TRUCKS

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity
4½, 7 and 10 ton Tractors
The Garford Road Builder

Distributors and Service Stations in all Large Cities

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Length 9′ 2″, Width 44″ x 12″ deep.
56½″ clearance under the top.

Why Pay Extra for Equipment—and Lose Time Waiting for It—When You Can Buy a Commerce Completely Equipped and Ready for Work?

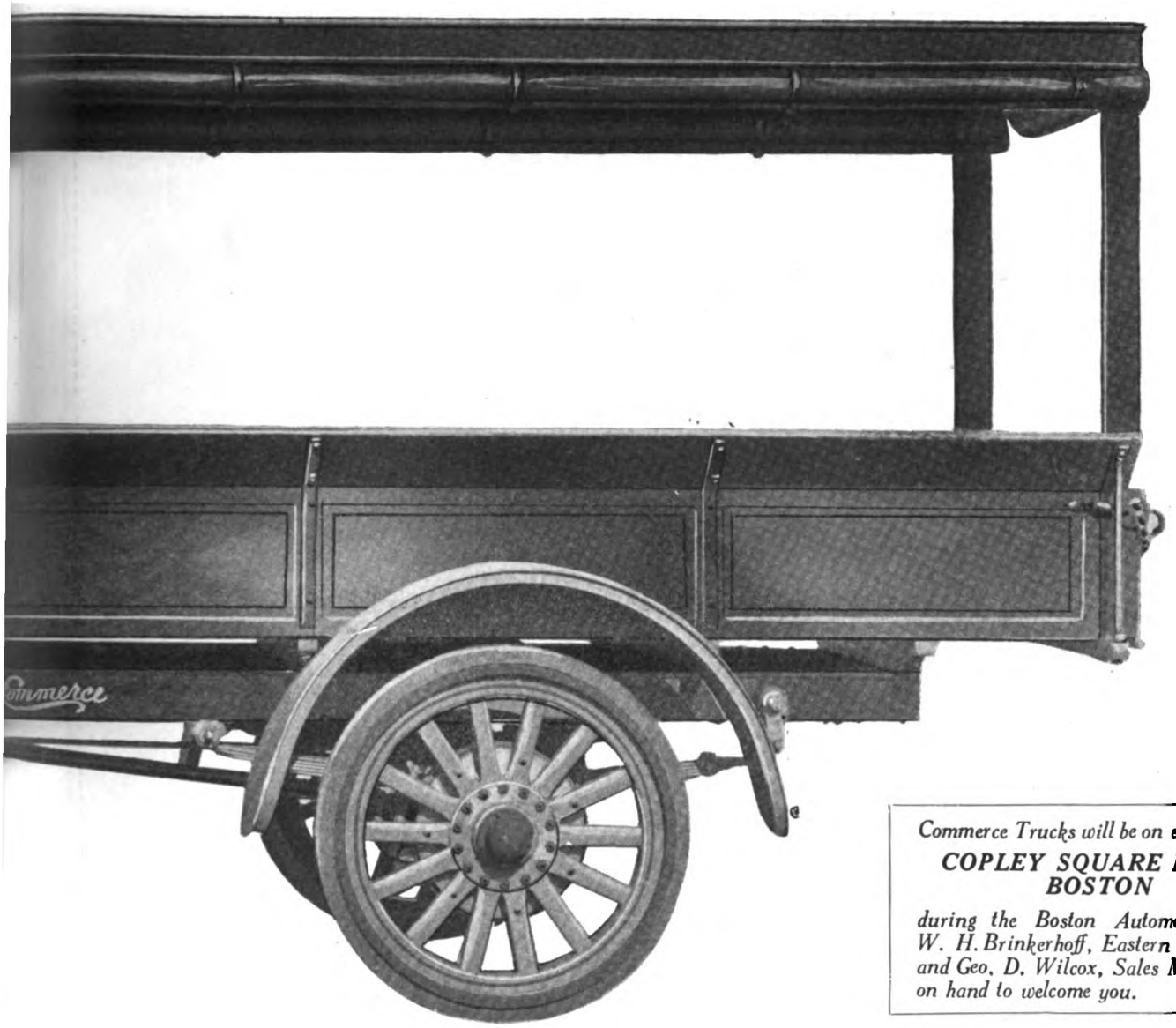
Commerce

ONE TON

MODEL EH
with complete equipment (see opp. page).
Post Top & Storm Curtain.

$1250

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Commerce Trucks will be on ***exhibit at the***
COPLEY SQUARE HOTEL BOSTON
during the Boston Automobile ***Show.*** *W. H. Brinkerhoff, Eastern* ***Dist. Mgr.,*** *and Geo. D. Wilcox, Sales* ***Mgr., will be*** *on hand to welcome you.*

WHILE EXTREMELY VALUABLE and really a necessity to a modern truck, the unusually full equipment carried by every Commerce Truck is only an indication of the extraordinary care taken by its builders to make it in every way the biggest value obtainable.

SEVEN YEARS IN ACTUAL SERVICE have proved the efficiency of the Commerce not only in standing up under hard, continuous delivery service, but in cutting upkeep costs to an irreducible minimum.

WE HAVE NOT IDLY STOOD UPON THE SPLENDID RECORD of this truck, but have constantly added to it every single real improvement that the progress of truckbuilding has brought to light.

ONLY THE HIGHEST QUALITY of material and labor could produce the perfection of design and ruggedness of construction that are contained in the Commerce Truck.

ONLY THE KEENEST FORESIGHT could have so fully equipped it—far in advance of all competitors.

¾-Ton Model, $975. Supplied with 3 types of bodies.

DEALERS: Have you seen the Commerce Method of advertising you in your home towns? Have you seen the SHORT Commerce Contract? Are you in on our "Big Business" campaign for 1917-18? If not, write us TO-DAY for details.

NO OTHER TRUCK HAS ALL THESE THINGS—INCLUDED IN THE PURCHASE PRICE!

COMPLETE EQUIPMENT. Three types of bodies—Windshield—Remy Starting and Lighting—Spotlight—Bumper (integral with frame)—Large Searchlights (with dimmers)—Stewart Vacuum System—Pierce Automatic Governor.

QUALITY UNITS. Continental Motor—Torbensen Internal Gear Rear Axle—Cast Tank Radiator with removable core—Truck Type Roller Bearing Front Axle—Unit Transmission, special truck type—Detroit Steel Products Company Springs.

Commerce Motor Car Company
DETROIT MICHIGAN

W. H. Brinkerhoff, Eastern District Manager, Belmont Avenue, Elmhurst, Long Island, N. Y.

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Announcing

"The Baby Wood"

HYDRAULIC HOIST

(TYPE "E")

—the lightest,
—the simplest,
—the most positive,
—the quickest-working

And the **most easily installed** dumping device made;

—the inevitable choice—therefore—of the 1917 buyer of light dumping equipment.

Expressly designed for trucks of 2-ton capacity; but equally adaptable to one and 3-tonners.

Supplied with new special model rear-dump body, forming an ideal combination for every manner of light hauling and dumping.

Weight approximately 250 lb.; requires a space of only 13½ inches between body and seat; body arms are outside of chassis frame.

Made to fit any chassis.

With production about to begin on this new model and every indication of a nation-wide demand, we again recommend that prospective buyers of this type of equipment communicate without delay.

Particulars upon request. Address all inquiries to Detroit.

Wood Hydraulic Hoist and Body Co.

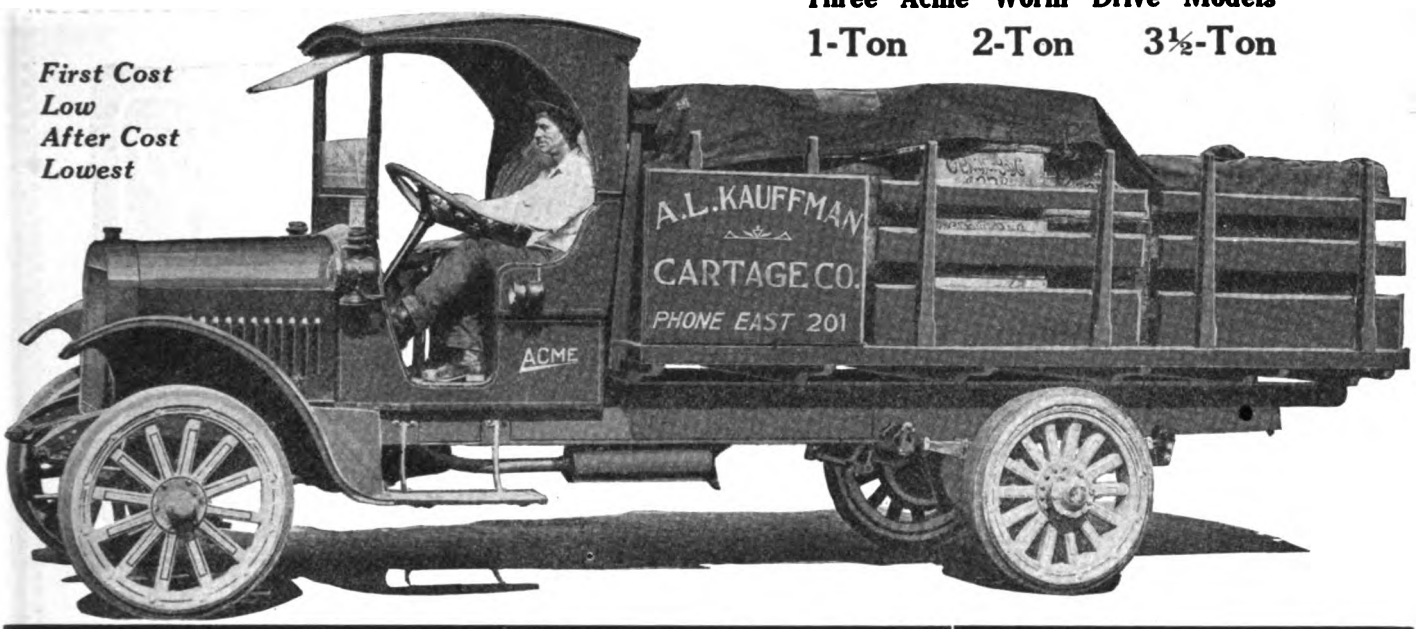
Sole Manufacturers

NEW YORK DETROIT CHICAGO

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Three Acme Worm Drive Models
1-Ton 2-Ton 3½-Ton

First Cost
Low
After Cost
Lowest



ACME
THE TRUCK OF PROVED UNITS

Sell the Truck Your "Prospects" Know!

Here is the big, powerful Acme—the greatest business builder—the truck that practically sells itself. Every "prospect" knows that Acme proved units mean supreme service in every field in which trucks are used. Continental motor, Timken axles, bearings and worm drive, etc.—these are the proved units that every truck user or prospective user is certain about. He knows they certify service!

You May Yet Profit by Our Bigger-Business Plan for Dealers!

The new Acme dealer plan may yet be open in your territory. Keenest motor merchants who now know the tremendous sales strength of our special offer were quick to see its dollar-saving worth. They know it's no ordinary agency proposition, but a big, definite offer that **makes sales quicker—reduces expense—increases profits.**

Rush your request for details of this plan. Know what it means to you. Know why alert dealers are quick to take advantage of it.

Acme trucks are sure sales makers. Proved units and Acme over-size construction, plus the giant strength of Acme factory co-operation and our great dealer plan, mean bigger, quicker profits from the start. **ACT NOW!** to know if this immediate opportunity is yet open in your territory.

CADILLAC AUTO TRUCK CO.

12 Mitchell Street
CADILLAC MICHIGAN

Rush This Coupon for Plan Details

Cadillac Auto Truck Co.
12 Mitchell St., Cadillac, Mich.

Please send your book illustrating and describing ACME Trucks and their proved units; also, furnish performance facts secured from owners showing gas economy, low upkeep, etc. Interested in.....

ton capacity. Now using.....

Name .....

Address .....

BUSINESS .....

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Haul It in a Hall

For Safety and Saving

There is nothing fine-drawn or delicate about the HALL TRUCK.

Here is a picture of one carrying four tons of steel. The rated capacity of this particular truck is three and a half tons, but just the same you can hop in, put your foot on the gas and drive this load away with absolute ease and safety.

And you can speed up, turn corners, plough through mud or sand, roll over rough roads—absolute ease and safety just the same!

That is the big point about the Hall—its in-built over-strength—its ability to rise to an occasion, to fill in an emergency, when time, money and business faith are at stake.

Big, burly, strong and speedy above all prospective needs, the Hall is an extraordinary time-saver, a cost-reducer, and the perfect embodiment of dependability.

In addition to its other merits the HALL is equipped with an IMPROVED WOOD HYDRAULIC HOIST, the fastest, most efficient and economical dumping device known, and a great cost cutter.

DEALERS: In addition to other sales helps and backing, we have arranged to finance your customers who desire to purchase on the deferred payment plan. Every HALL dealer is well taken care of and making friends and money fast. Better get in on this prosperity!

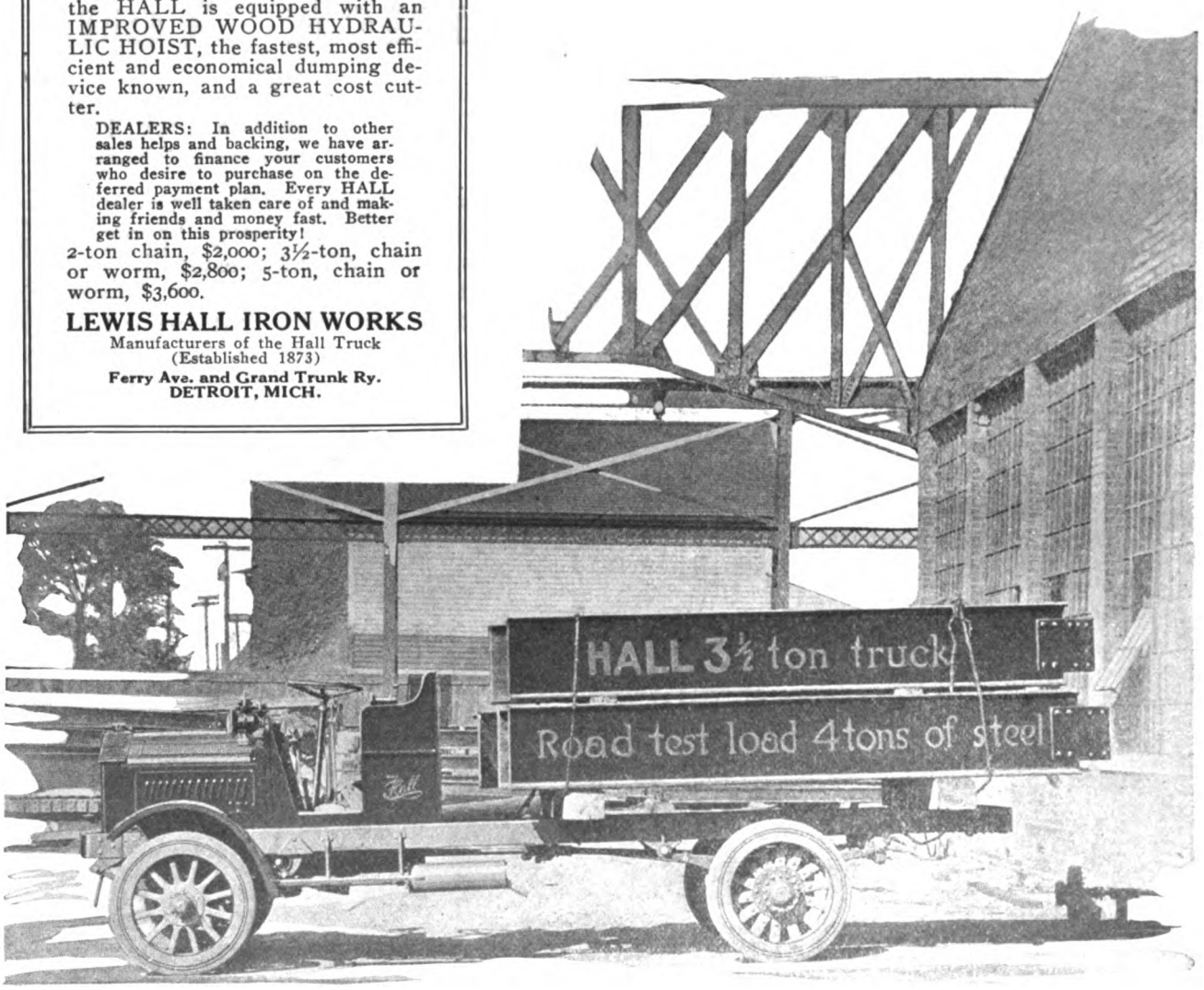
2-ton chain, $2,000; 3½-ton, chain or worm, $2,800; 5-ton, chain or worm, $3,600.

LEWIS HALL IRON WORKS

Manufacturers of the Hall Truck
(Established 1873)

Ferry Ave. and Grand Trunk Ry.
DETROIT, MICH.

THE Hall TRUCK



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BOCK

Everything Rolls

Bock bearings carry the tremendous loads that *any* roller bearing is capable of carrying.

But they do *more*.

They *entirely eliminate* wearing, grinding end friction.

The bearing end of each Bock is the segment of a sphere. It *rolls* where other bearings merely scrape and slide.

Everything rolls in the Bock.

Consequently, *combined with* the greater strength of the roller bearing you get *all the good features of the ball bearing.*

Engineers are enthusiastic over the Bock.

And it is replacing all other types of motor car bearings as fast as we can fill the orders.

Ball Ends

The only roller bearing with frictionless rolling end contact

The Bock Bearing Company - - - - Toledo, Ohio

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive	Two-Ton Worm Drive	Three-and-One-Half-Ton Worm Drive
$1095	$2200	$3100

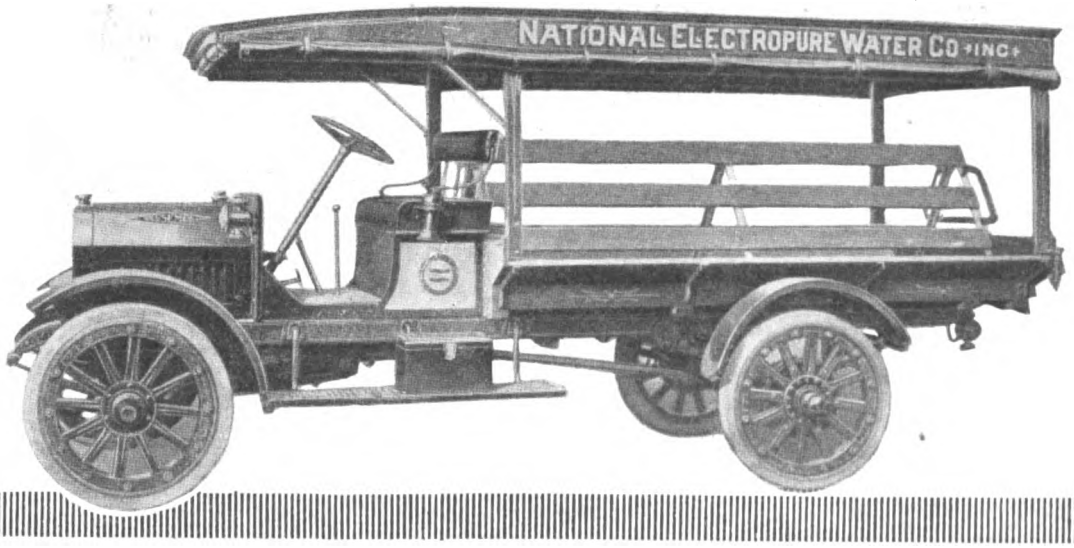
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

Bessemer Motor Truck Company **Grove City, Pa.**

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State



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"Get the Quality" Booth "Get the Quality"

IF you buy felt washers simply by the price, you can always find some that are lower priced than ours. But if you care for quality, service and perfection, BOOTH'S are the lowest priced washers made.

Send your prints and specifications to

THE BOOTH FELT COMPANY, Inc.

440-450 19TH STREET, BROOKLYN, N. Y.
116-118 SOUTH 5TH AVENUE, CHICAGO, ILL.

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What Signal "*On the Job*" Means to the Manufacturer

The best purchasing agent is the one who keeps the raw material coming in a steady flow to meet your manufacturing requirements; who handles his job so skillfully and reliably that you do not have to worry about him who, in a word, "is on the job."

The best sales manager is not the sensational exploitive character who is continually endeavoring to impress you with his powers, but the energetic, able man who sells all you can make at a profit, and keeps your customers satisfied. "On the job" describes his ability, too.

The virtues of the factory superintendent who handles his work so easily and smoothly that the factory becomes a huge, efficient, producing organization may be summed up by the statement that he is "on the job."

Whether in dealing with men or machines, the expression describes the sum of all desirable values. The man who is "on the job" does not need to explain—he delivers the goods.

In the same way the expression "on the job" boils down into a few words all the desirable qualities of a good motor truck. Its quality is best evidenced by your unawareness of its existence. You can dismiss the truck problem if you know your motor trucks are "on the job."

We did not fix the slogan "on the job" on Signal Trucks. It is the condensed expression of the experiences of Signal Truck users—it fits the occasion because it describes the Signal Quality. The circle of buyers for whom this applies is growing larger every day. Write

Signal Motor Truck Co.

Detroit, Mich.



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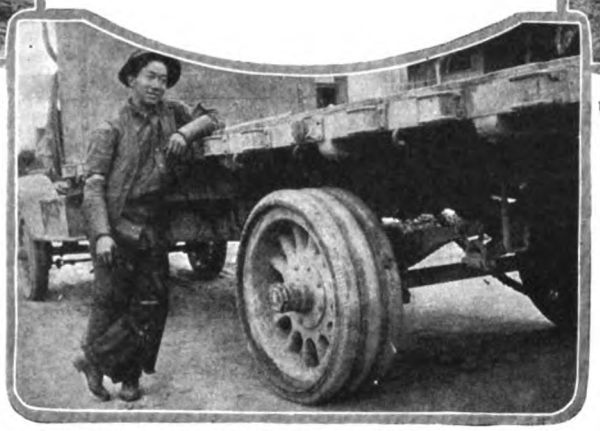
KELLY-SPRINGFIELD
Triplet Tires



An Oregon Contractor's Packard



using Kelly Triplets with success



A Mack truck doing heavy hauling for a California cannery

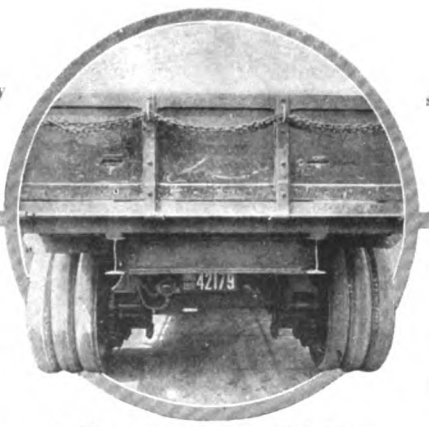
KELLY-SPRINGFIELD Truck Tires in triplet form are becoming popular throughout the United States because of their greater tractive quality, for the actual saving in tire cost and because of the reduction of wear and tear on trucks. Where, for example, three 40x5 tires replace two 40x7's, the wheel weight is reduced 234 lbs. and the cost of replacement of a 40x5 single tire is one-third less than in the case of renewing one 40x7.

Kelly-Springfield Truck Tires are of that quality one would naturally expect to find in a product which has stood the test of twenty years and retained during that period its leadership, not upon extravagant claims, but by actual service delivered.

Kelly-Springfield Tire Co. General Offices, Broadway at 57th Street, New York
General Sales Dept., 1900 Euclid Avenue, Cleveland, Ohio

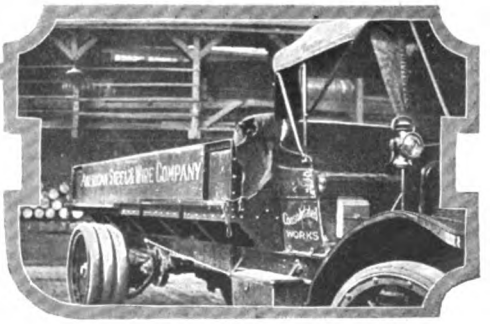
A White truck used in heavy



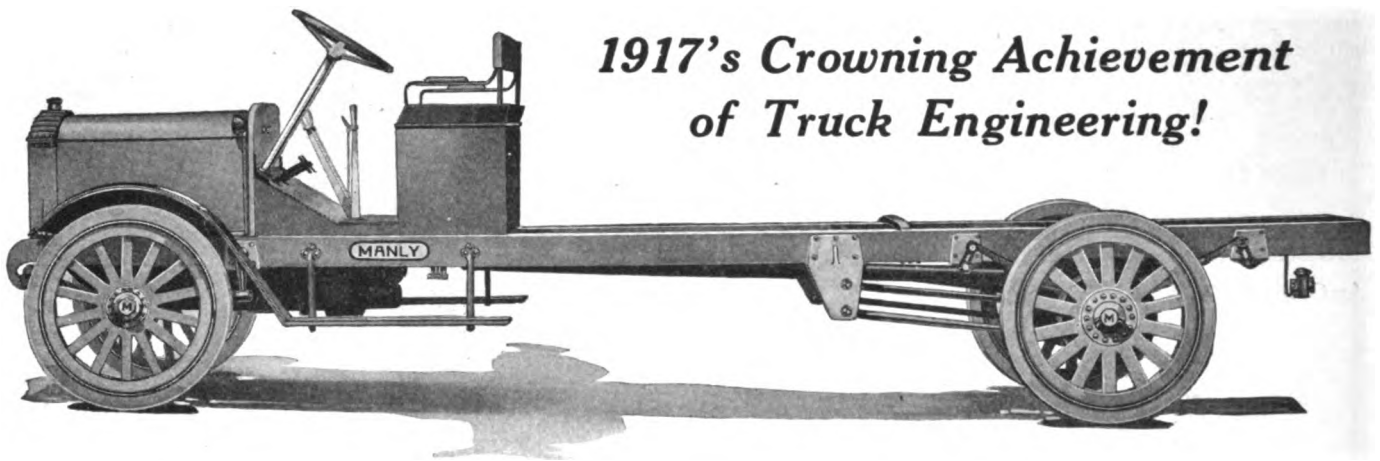


A Close-up of Kelly Triplets

service in Cleveland, Ohio



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1917's Crowning Achievement of Truck Engineering!

MANLY

1½-Ton 2½-Ton TRUCKS

20 Things to Think About

Gear ratios that give road speed without racing the engine in second, that give a pull equal to a four-speed gear set in low and that give an emergency leverage in reverse.

A design that takes all drive and torsion load off the springs, that stops motion of the universals, prevents false movement of the driving gears and has no bending loads.

A front spring suspension that prevents wheel wabbling, tire wear, jerkiness of the hand wheel and breaking strains on the steering parts.

A control that maintains the road speed where you want it without requiring constant adjustment of throttle and spark.

Brakes that are not affected by rough roads or change in load, and that operate through equalizers.

A truck without a single out of the way point for either lubrication or adjustment.

An ignition system without low tension wiring and with only four leads on the whole car.

Every part made according to standards adopted by the Society of Automobile Engineers.

A jaw clutch transmission that engages easily regardless of truck or engine speed.

A balanced steering gear that has no thrust loads or thrust bearings.

A clutch that engages smoothly no matter how quickly the pedal moves.

A fan mounting that makes an even suction over the whole radiator.

Universals that do not wear and that require no oiling.

A radiator guaranteed for the life of the truck.

A built-in governor that was not an afterthought.

Annular ball bearings throughout the truck.

An engine that takes the truck anywhere.

Power plant design that burns any fuel.

Springs without center bolt holes.

The most efficient worm drive made.

AT Chicago, during the Automobile Show, engineers, dealers and business men will have an opportunity to see for the first time a truck which strikes a new and long awaited note in commercial car construction—the MANLY.

Compounded of the Experiences of Others, experiences which have been 15 years in the learning, improved in accord with accepted tenets of domestic and foreign engineering practice—the MANLY Truck approximates as closely today the goal of **practical perfection** as it is possible for a truck of this day and age to approach.

The MANLY Truck is a trail-blazer—revolutionary perhaps in some respects, but proved in the purifying test of workaday service.

Call Calumet 6651 for demonstration, visit our factory, or write for handsomely illustrated descriptive catalog.

Territorial arrangements now being made for early deliveries

MANLY MOTOR CORPORATION
WAUKEGAN ILLINOIS

1432 Michigan Avenue, Chicago, Illinois

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For the Quick Jobs—

Many trips—sudden stops—quick starts—frequent shifts of gears,—these are the severe tests to which a truck—and its transmission—are subjected in city use.

Delivery schedules must be handled promptly and unfailingly. Breakdowns—delays—failure to deliver the goods at the time promised,—all of these mean customers dissatisfied—loss of trade.

For that reason, dependable Covert transmissions are being made standard equipment by an ever-increasing number of discriminating truck manufacturers.

Made in a complete line of types and sizes, there is a Covert transmission for every truck and pleasure car requirement.

Will you let our Engineering Department study your particular transmission problems?

Covert Gear Company, Inc.
Sales Office, Detroit, Michigan
Factory, Lockport, N. Y.



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Announcing a new Disc Clutch Facing

Cor

DISC CLUTCH FACING

Patent Applied For

This is our announcement of CORTEX—a new disc clutch facing which is destined to replace old style asbestos facings on automobiles of the future.

In addition to being more durable and more resilient than facings of asbestos compositions, CORTEX offers the following important advantages:

1. Requires materially less spring pressure.
2. Does not glaze over or become hard in use.
3. Presents a better co-efficient of friction.
4. Costs from one-half to one-third less.
5. *Is*, and *will be*, promptly available

Asbestos, as is generally known, is now very difficult to obtain. Only limited quantities are available and these at a greatly increased cost. Here is a disc clutch facing that is *better* than facings made of asbestos compositions—a disc clutch facing that you can *get*—at from one-half to one-third less cost. A request, written on your business letterhead, ad-

Hide Leather

227E S. MERIDIAN ST.

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Better than Asbestos Facing
Cheaper than Asbestos Facing
Instantly Available

tex

DISC CLUTCH FACING

Patent Applied For

vising dimensions, number of discs, and type of disc (floating or riveted to plate), will bring you a sample set of Cortex facings, promptly—and without charge. Write today.

Read What This Engineer Says About Cortex, After Actual Tests

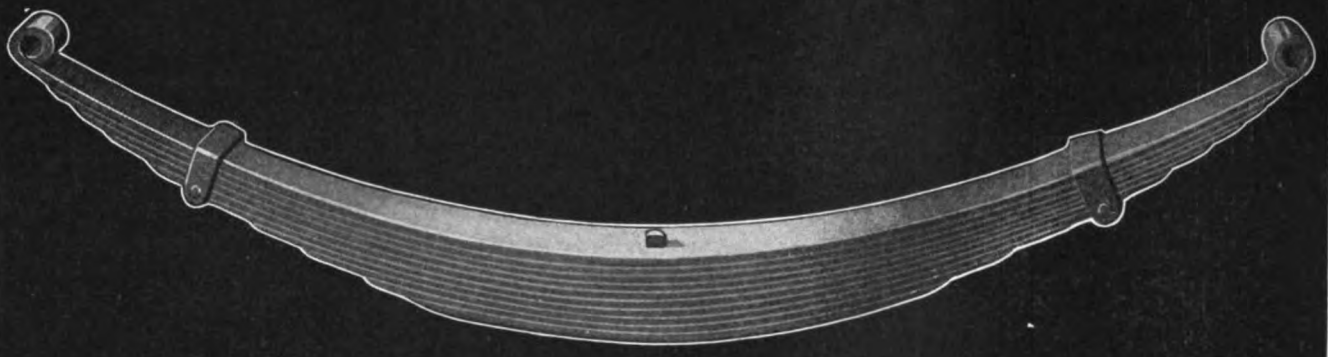
This statement, from a competent engineer, is representative of the opinion of *all* who have tested Cortex:

"We found, on experimenting with Cortex facings that the usually accepted engineering principles as to the frictional force in pounds to be applied per square inch need not be carried out at all. We mean by this, that our clutch with recognized asbestos facings required a spring weighing 375 pounds, while with Cortex facings we have been able to cut spring pressure down to 200 pounds. We have every reason to believe that this can still be cut down further. In fact, we intend to carry out experiments with a spring weighing 150 pounds. We believe that the cutting down of this spring pressure is simply due to the fact that Cortex facings have a great deal more cushion to them than the recognized asbestos facings and due to this cushioning effect the spring pressure per square inch can be cut down considerably."

& Belting Co.
INDIANAPOLIS, IND.

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"The Spring Is the Thing"



MATHER

Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

Minimum of Vibration

Genuine made only by

The Mather Spring Company

Toledo, Ohio

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Worm Gear Axles Reduce Upkeep Cost

There is no type of final drive today which shows so low an upkeep cost as the worm gear type.

This is true, because once installed a worm gear unit itself requires proper lubrication only. Its great length of life without any adjustments or substitutions and the fact that it improves in its operation with age all tend to designate it as the most economical form of drive.

BAUSH
WORM DRIVE

Baush Worm Gear Units are furnished in either the straight face or hour glass type.

BAUSH MACHINE TOOL CO.
SPRINGFIELD
MASSACHUSETTS

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SERVICE

"The Steering Gears that Predominate on Motor Trucks"

THE enormous bearing surfaces in Ross Gears, combined with highest quality in materials and workmanship, guarantee the safety, reliability and easy operation which is your first demand in the steering equipment of your motor truck.

Second only in importance to mechanical quality is the question of the SERVICE you can get in deliveries. In specifying

ROSS GEARS

you have the satisfaction of knowing that behind the product itself stands an organization of skilled mechanics, working under almost ideal conditions —a fireproof, daylight plant equipped with the most modern, specially designed machinery—a company of highest financial responsibility with unequalled facilities for securing the necessary raw materials.

On the basis of the quality of our product and the service we are prepared to give, Ross Gears have been adopted as standard equipment on 124 different makes of motor trucks.

Write for catalog and any special information desired.

ROSS GEAR & TOOL CO.
750 Heath Street Lafayette, Ind.



PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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The COMMERCIAL VEHICLE
Read by Business Men

Published on the first and 15th of every month
Entered as second-class matter, September 13, 1906, at the Post Office, New York, N. Y., under Act of Congress, March 3, 1879

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The Commercial Vehicle, Inc.

239 west Thirty-ninth street
New York City

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Canada ..... 3.00 per year
Foreign Countries ..... 4.00 per year

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Changes in copy for advertisements in the next issue to be in the office of publication not later than 10 days before date of publication

WYMAN-GORDON



CAREFUL!

THIS TEST establishes the correctness of hardening after heat treating.

HEAT TREATING—that elusive, delicate, intangible process—so vitally essential to the value of a drop-forging.

THIS MAN must not only be careful—he must know how to be careful. He must not only do his best—his best must be *the* best.

IN THIS—AS IN ALL OTHER ESSENTIALS of a successful drop forging—the Wyman-Gordon organization excels.

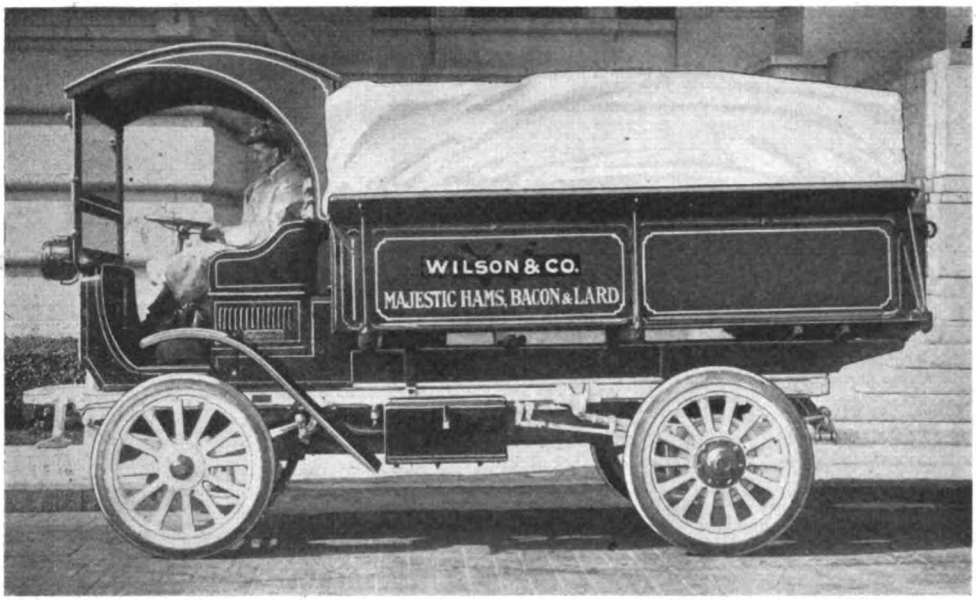
THE WYMAN-GORDON GUARANTEE is the hall-mark of genuine economy—the unfailing sign of absolute satisfaction.

WYMAN-GORDON CO.
Worcester, Mass. *Cleveland, O.*



GUARANTEED FORGINGS

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WILSON & CO. (formerly Sulzberger & Sons Co.), one of the largest Chicago packing house companies, are installing Autocar commercial vehicles at their many branch houses throughout the country. Since the installation of Autocars a marked increase in sales has resulted, with a material decrease in the cost of deliveries.

Write for illustrated catalog and list of more than 4000 concerns using Autocars in every line of business.

Chassis $1650

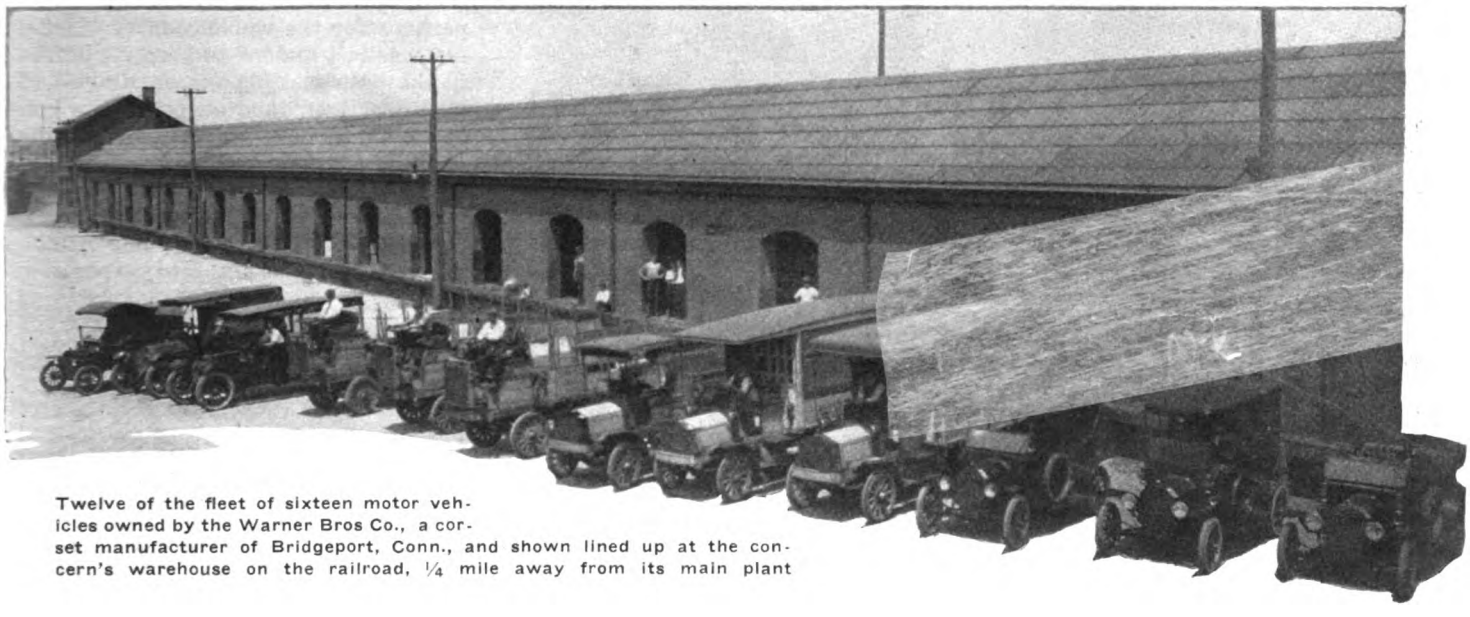
THE AUTOCAR COMPANY

ARDMORE, PA.

Established 1897 **MOTOR DELIVERY CAR SPECIALISTS**

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The Commercial Vehicle
Read by Business Men
Vol. XVI March 1, 1917 No. 3



Twelve of the fleet of sixteen motor vehicles owned by the Warner Bros Co., a corset manufacturer of Bridgeport, Conn., and shown lined up at the concern's warehouse on the railroad, ¼ mile away from its main plant

Trucks Haul 40 Miles Overland and Overcome Labor Shortage

Freight Embargo Also Circumvented by Motors Transferring Goods to New Assembling Plants at a Distance—Trailers Used for Bulky Loads

By Joseph Husson

QUICK and reliable service rendered by a fleet of sixteen commercial vehicles has been largely responsible in enabling the Warner Bros. Co., a corset manufacturer of Bridgeport, Conn., to double its business in the past 4 years. These trucks handle every bit of goods entering and leaving the factory, as the plant is an isolated one located ¼ mile from the nearest railroad. When labor could not be obtained in Bridgeport because of the demands made by the large number of ammunition factories, its trucks enabled the Warner company to establish three assembling plants in nearby cities and deliver to them direct. This was the only method possible because of the freight car embargo along the Atlantic seaboard.

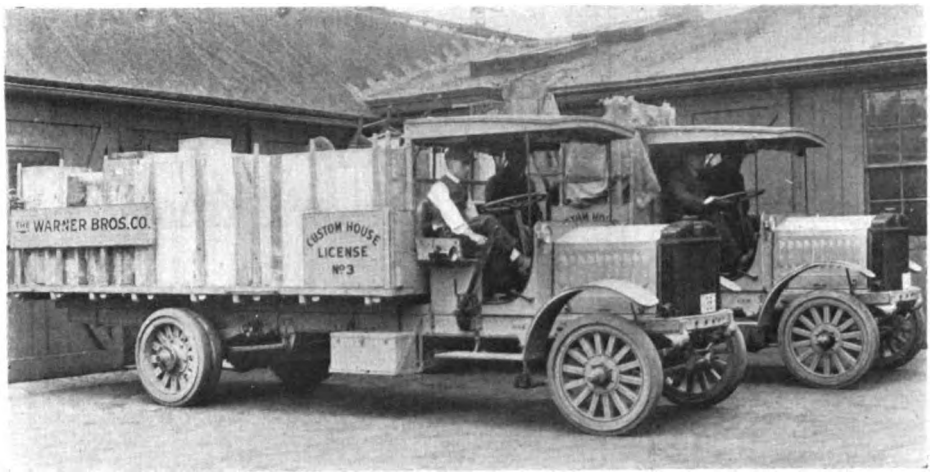
How the Labor Problem Was Solved

Motor trucks solved the labor problem for the Warner company when the war broke and turned that city into a giant arsenal for the world's firearms and ammunition. The sudden demands of that inflated industry swallowed up the available male and female workers for miles around and necessitated the importation of outside help, which increased the population of Bridgeport 50 per cent in less than 2 years. Shortly after the war began Bridgeport had about 102,000 inhabitants. Late last fall she boasted of more than 150,000 souls.

Ammunition plants pay their workers a higher scale of wages than other manufacturing concerns, in this instance because of the large orders placed and the necessity of rapid production in almost unheard-of quantities. For this reason, Bridgeport's war material factories got the pick of the labor and secured all that was available.

Now the Warner Bros. company does not make ammunition or firearms, but is famous for its ladies' corsets, brassieres, children's hose sup-

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The two Riker 3-ton trucks equipped with platform bodies with removable side stakes for ease in loading and unloading. These two vehicles have been employed principally to haul raw products from the main plant in Bridgeport to the new assembling factories in Danbury and New Milford from which they bring back finished goods. The round trip to New Milford is about 80 miles, the trucks each making one trip per day every day of the week except Saturday. The route traversed between Bridgeport, Danbury and New Milford is shown on the map on the next page

porters and waists, and is reputed to be the largest corset manufacturer in the United States. When its business increased it found it impossible to procure sufficient female help to keep pace with its orders.

Faced with the necessity of cancelling orders because of inability to deliver within the specified time, the Warner Bros. company turned to its fleet of motor trucks in the time of need and did not find it wanting.

Labor Procurable for New Plants

Unable to get labor in Bridgeport, it decided to open three subsidiary plants where girl labor could be secured at reasonable wages. One plant was put into operation in New Milford, Conn., approximately 40 miles from Bridgeport by road, a second in Danbury, 30 miles away and a third plant in Stamford, about 23 miles distant. The company's trucks were put into service hauling raw stock from the company's warehouse and parts from the main factory to the new plants and bringing back finished or partly-assembled goods.

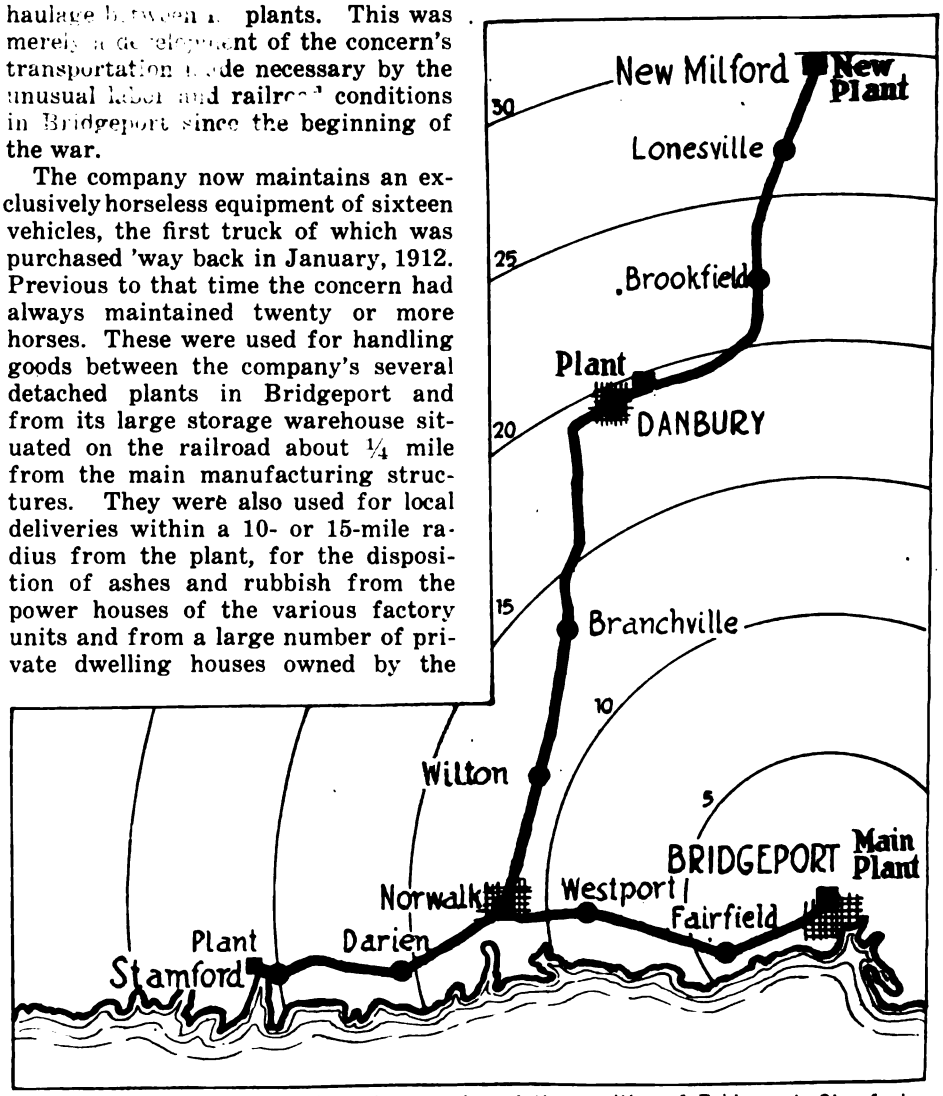
In this work the trucks saved the day by solving not only the labor problem, but overcame railroad conditions as well. Due to the great railroad congestion along the Atlantic seaboard, brought about by the lack of shipping bottoms for export business, it was impossible to obtain anywhere near normal freight train service for short hauls to points like New Milford, Danbury and Stamford. The motor trucks stepped in and filled this grave breach affecting the company's business, and with such good results that its production has more than doubled in the past 4 years.

The Warner company did not purchase its first truck for the interhaulage between plants. This was merely a development of the concern's transportation needs made necessary by the unusual labor and railroad conditions in Bridgeport since the beginning of the war.

The company now maintains an exclusively horseless equipment of sixteen vehicles, the first truck of which was purchased 'way back in January, 1912. Previous to that time the concern had always maintained twenty or more horses. These were used for handling goods between the company's several detached plants in Bridgeport and from its large storage warehouse situated on the railroad about ¼ mile from the main manufacturing structures. They were also used for local deliveries within a 10- or 15-mile radius from the plant, for the disposition of ashes and rubbish from the power houses of the various factory units and from a large number of private dwelling houses owned by the Warner company in the immediate neighborhood.

Now every particle of the company's goods handled over the roads is done by motor vehicles, even to the ashes and rubbish and for the in and out transportation of parcel post orders and mail.

The Warner company is noted for its progressiveness in every branch of its business, including that of transportation. Even when it used nothing but horses its stables were models for the entire state of Connecticut and perhaps for the whole country. Nothing was left undone to keep its horses in the best possible surroundings and health. Even then everything which could be done mechanically in the stables was done that way. The stables were located near the plant and were visited every day by the transportation superintendent, one of the heads of the concern. They were pro-



Map of a portion of Connecticut showing the relative position of Bridgeport, Stamford, Danbury and New Milford. The heavy black lines indicate the routes traversed between the Warner company's main plant in Bridgeport and the new assembling factories in the three cities. These plants were made possible only through the use of the trucks, for due to the freight car embargo along the Atlantic seaboard it was impossible to ship goods by rail with any degree of satisfaction as to the date of delivery. The concentric circles are 5 miles apart and are drawn about the main plant as a center. They indicate clearly the length of the three routes.

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vided with mechanical hay conveyors which brought the hay to the horses' noses and left them nothing to do but open their mouths and eat it. Likewise mechanical measuring devices were provided for proportioning the amounts of oats, bran, etc., fed the four-footed beasts of burden.

All Horses Have Been Sold

The horses and all of the labor-saving equipment were under the watchful eye of a competent veterinarian on the company's payroll, whose sole duty it was to keep the animals in fit condition to perform the concern's work without interruption. Each horse was critically inspected every week for the symptoms of developing ailments and each was given his usual periods of rest during the month. Even with all these precautions for their welfare the horses were unable to keep pace with the company's progressiveness in the other departments of the business.

In spite of everything done to keep them in shape, one or more were continually becoming incapacitated at just the time when the concern's work demanded them most. The animal equipment finally became such a source of worry and concern that it was decided that it must go. This was in January, 1912, when the concern's first motor truck was purchased. Four Reliance 3½-tonners were bought at that time. The horses were gradually eliminated, so that after about 2 years horses were a thing of the past so far as the Warner company was concerned.

Warner Plant Off Railroad

The Warner plant is located at somewhat of a disadvantage, in that it is situated in the center of a residential section, with the nearest railroad siding ¼ mile away. As the great bulk of the company's raw stock is received by rail, this necessitates the haulage of the goods from the siding to tne plant and the return transfer of that portion of the manufactured product shipped by rail to various parts of the country.

In this work the complete round-trip haul between the plant and the railroad is not over ½ mile, so that the trucks must be loaded and unloaded in the minimum of time in order that they may not become mere repositories for goods. This has been accomplished by the establishment of a warehouse along the railroad siding in which the goods may be unloaded from the cars and in which goods to be shipped by rail may be stored; by the use of elevating handtrucks in both warehouse and plant and loading platforms level with the floors of the truck bodies at the plant.

Only carload lots are shipped by rail from the warehouse, the smaller shipments either being held until a carload can be made up or hauled to the several public freight yards in Bridgeport. The warehouse enables the trucks to haul full loads in both directions. It serves as a building in which the goods can be sorted and routed without holding the trucks waiting, such as would be the case if the goods was delivered direct from the truck to the freight car.

It is evident that if the trucks had to wait for empty cars to be spotted where the goods could be unloaded, considerable delays would ensue. It is conceivable that such delays, if of considerable duration, might make the cost of truck haulage greater than that with horses, due to the greater daily operating charges of the former and because of the inability to make use of the great ground-covering characteristics of the truck as compared with the horse wagon.

Such conditions have been made impossible at the Warner plant by the means mentioned above in connection with a schedule for arrival and departure of each of the trucks working between the various units of the plant and the warehouse. These schedules tend to eliminate delays caused by not having the goods in readiness for loading.

Trucks Run on Schedules

As an example of the manner in which the trucks hauling to the warehouse and to the freight stations are employed, one 3-ton truck hauled 1550 tons over an average haul of 1 mile in 26 days of 9 hours each. This gives an average of approximately 60 tons per day of twenty trips with 3 tons carried per trip and a total average daily mileage of 20.

All the orders received are filled on the same day as received, the goods being taken from a stock carried in the warehouse or direct from the plant according to the size of the shipment. When the plant production is in excess of the orders, the surplus is hauled to the warehouse to be later made up into carload lot orders or drawn for delivery to the freight yards or boat wharves for l.c.l. shipments.

Since the fall of 1915 the shipments to the docks in Bridgeport harbor have been very heavy because of the embargo on freight cars along the Atlantic coast rail lines. There are several steamship lines carrying freight to New York and others to New England points. The goods of the Warner company is shipped to three main dis-



A portion of the Warner Bros. fleet, the three 3½-ton G. M. C.s at the right and a re-built Locomobile passenger chassis at the extreme left. The heavy trucks are used to haul the company's goods between the main plant in Bridgeport and the various railroad yards and boat wharves in the same city. The re-built Locomobile, one of two vehicles of the same make and size, has an express body with roll side curtains and is used to deliver the company's goods locally to Bridgeport. It is also used for small rush deliveries and for the collection of small incoming express shipments.

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tributing points, New York, Chicago and San Francisco. Almost all of the central west and extreme west shipments are shipped by rail in carload lots. Much of the goods going to New York was shipped in the same manner until the freight embargo.

All Goods Handled by Truck

But no matter how the goods is shipped, it is handled at least twice and sometimes three times by the company's motor trucks. It is first hauled to the plant as raw material, then as a finished product direct to the warehouse as stock or carload shipments, or from the warehouse to the various rail yards or boat wharves or to the retail stores within the Bridgeport territory.

It is thus self-evident that the Warner company's trucks play a large and important rôle in its business and the fact that it has more than doubled in the past 4 years is attributed by the Warner concern to the quick and reliable service which its commercial vehicles have rendered.

Loads in Both Directions

Aside from the manufacture of corsets, hose supporters, etc., the Warner company also manufactures paper boxes for its various products. This manufacturing end of the business is carried on mostly at the outlying plants in New Milford, Danbury and Stamford. The trucks used in this work carry loads in both directions, taking raw or partly-assembled material from the main plant and bringing back finished or semi-finished products. Rapid unloading and loading methods similar to those used at the main plant and warehouse are also pursued at the company's three outside plants, so that the trucks in that service, carrying full loads in both directions, are operated at their maximum efficiency and give the greatest returns on the capital invested.

These trucks have really been largely responsible for the physical growth of the company's plants during the past 3 years, for without them the outlying plants would have been practically impossible because of the inability to get goods to and from them under the poor existing railroad conditions. Even if the concern had been able to ship by rail, the charges per ton would have been greatly in excess of the low cost per ton-mile as effected by the trucks in carrying full loads in each direction.

The Fleet Make-up

The present Warner Bros. fleet consists of sixteen vehicles, of which eleven are conventional motor trucks, two re-built Locomobiles and four Fords, one with a delivery body and the other three with passenger car bodies. The trucks vary from 1 to 3½ tons in capacity. There are three G. M. C. 3½-ton chain drivers; two 3-ton worm-driven Rikers; three 2-ton Packards with chain final drive and two worm-driven trucks of 1-ton capacity, one a Mack and the other a Selden.

One of the G. M. C.'s hauls coal from the company's own pocket to the main plant. The other two of the same make and capacity are employed continuously in general freight haulage between the factory and the freight stations and boat wharves. These vehicles are fitted with removable side-staked bodies for easy loading and unloading.

One of the Packard 2-tonners is equipped with a dumping body and is used exclusively for the collection and disposal of ashes and rubbish from all the buildings of the plant and from a large number of private houses owned by the company in the immediate vicinity. The other Packard is fitted with a large express type of body with side roll curtains and is used for delivering finished paper boxes and printed advertising matter to Bridgeport factories and local merchants or to the railroad or boat express offices for wider distribution.

The finished paper boxes delivered by this Packard truck are a surplus over those required by the Warner company for its own use. This sale of its surplus stock is an indication of the Warner concern's progressiveness in that it runs every one of its departments at full capacity irrespective of dull seasons in order to obtain the lowest possible manufacturing cost. As in the above case, if the box production is in excess of the Warner company's demand for containers for its various products, the company will turn out enough for itself and then contract to furnish boxes, perhaps of a different size, for the highest outside bidder.

Surplus Goods Sold Outside

Similarly when the demand for ordinary paper boxes is low it will manufacture plush-covered wood boxes for jewelry or table service and sell them to the highest bidder. If the required production of the company's advertising printed matter has been secured, the concern will print folders and the like for other concerns. This same spirit of efficient manufacturing is exemplified in the schedule maintenance of the company's trucks hauling goods between the plant and the warehouse and the operation of those vehicles running to the outlying plants with full loads in both directions.

The Selden and Mack 1-tonners are used to carry finished corsets, etc., from the plant to the warehouse and back again to the plant if the stock in the former building has to be drawn upon for l.c.l. shipments.

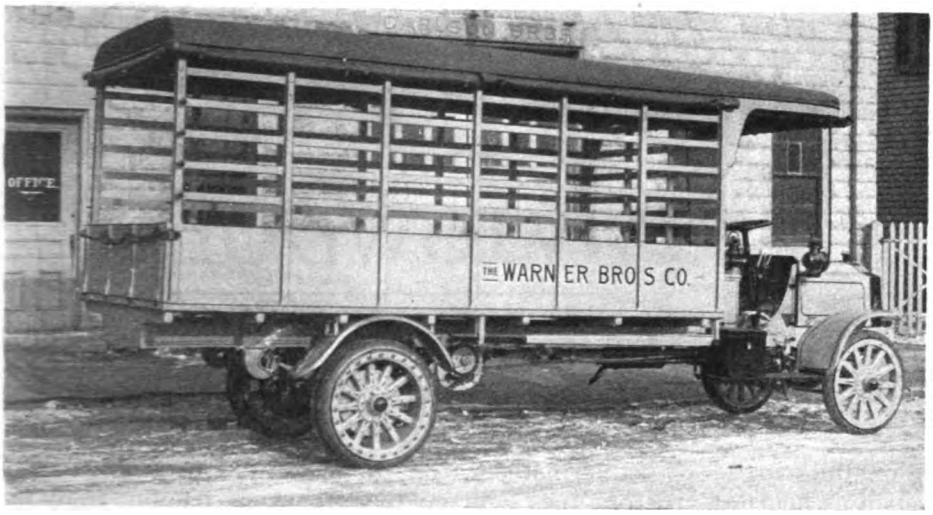
The two re-built Locomobiles are fitted with express bodies with roll side curtains and are employed to deliver finished products, boxes, small printed matter and express shipments locally to Bridgeport. They are also used for small rush deliveries and for the collection of small incoming express shipments.

One of the Fords is equipped with a panel body and is used to collect and carry parcel post matter to and from the post office. It is also used for special deliveries. One Ford with a touring body and one with a roadster type are used to carry guests and officers of the company between the plant and



The Selden 1-ton worm-driver used by the Warner company to haul finished goods from the concern's main plant to the warehouse, on the railroad, about ¼ mile distant. A considerable amount of stock is carried in the warehouse for carload shipments. This stock is also drawn upon for l.c.l orders delivered by the trucks.

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One of the three Packard 2-ton chain-driven trucks used for the distribution of finished paper boxes and printed advertising matter to Bridgeport factories and to the various railroad and express offices in the city for wider circulation.

the railway station and for other special trips. The fourth Ford has a closed body and is used as a taxi to take any of the girl employees home in case of sickness.

Three Trucks in Inter-plant Haulage

Three trucks are used in the service between the main plant and the two separate plants in Danbury and New Milford. These include both of the Riker 3-tonners and the 2-ton Packard. Due to the fact that Saturday afternoon is almost universally observed as a holiday in the manufacturing plants in New England, the trucks running to the small plants make only five trips a week, that on Saturday being omitted. Both the Danbury and New Milford plants assemble parts and manufacture paper boxes. The Stamford factory is purely a box shop and because of this the trucks make only two or three trips a week between it and the main factory, carrying raw stock on the out trips and finished products on the return.

The goods received at the Bridgeport plant consist mostly of wire and metal, which are there made into various parts and then transferred to the Danbury and New Milford shops for assembly. Raw stock for box manufacture is also carried. The return loads of the trucks are made up of assembled corset parts and the like and finished paper boxes.

The large bulk of the boxes and their light weight introduced different conditions for the in and out loads. While the out loads of parts and raw stock were equivalent to the carrying capacity of the trucks, the in loads were but a fraction of the maximum carrying weight because of the light weight of the boxes and the body size limitations.

In an endeavor to solve this problem by carrying capacity loads in both directions, the Warner company experimented with four-wheeled trailers. The first trailer was of 2 tons capacity and was used behind a 3-ton truck, each vehicle being loaded to its maximum capacity.

This outfit proved unsatisfactory mainly because of the many hills which had to be negotiated between Bridgeport and Danbury, but more particularly farther along the route to New Milford. Many of these hills have grades of from 10 to 15 per cent and the speed of the trucks hauling trailers was reduced to such an extent because of the grades that it took almost twice as long for the truck-trailer combination, with slightly less than double the load, to make the run as it did the truck alone. Besides, considerable trouble was experienced with the rear tires of the truck. These wore excessively fast and in one or more cases separated at the base and rolled off.

As a result, the 3-ton truck with a 2-ton trailer, each carrying a full capacity load, was abandoned and a 2-tonner with a 1½-ton Troy trailer employed instead. These were each loaded with capacity burdens and tried out over a period of several months. Although the rear tire trouble was lessened, the speed of the outfit was still greatly reduced as compared with the truck alone. The latter would make the one-way trip in 2½ hours, while the truck and trailer required 4 hours.

Loads Reduced Because of Hills

These results were considered unsatisfactory because of the time reduction and a greater cost per ton-mile hauled. The best all-around results have since been obtained by carrying a total load of 2 tons on both the truck and the trailer. On the out trips the cubical capacity of the truck and trailer bodies is only partially used, but on the return trips with paper boxes it is all made use of. Under these conditions, the net efficiency of the outfit is greater than that of the truck alone, even considering its slight advantage of speed.

Of course, these deductions of the Warner company as to its trailer operation must be considered in the light of the special conditions of long comparatively steep-grade hills and country roads over which the outfits have to be run. Over better improved highways with smaller grades it is probable that larger loads might have been carried with an equal degree of success.

All of the Warner trucks are maintained in the company's own garage at the Bridgeport plant. The drivers have been recruited from the ranks of the crew of men which formerly drove the concern's horse wagons. These men were first used as helpers on the trucks and then promoted to drivers as the size of the fleet was increased. After being thoroughly trained as truck drivers by actual experience under the eyes of the delivery superintendent, they have proved very satisfactory because they knew the company's loading and unloading methods and were well acquainted with the class of goods handled. Helpers are used on all of the trucks except the two re-built Locomobiles and the Fords. These men are trained in the operation of the trucks while still helpers, so that in case of drivers leaving the employ of the company or being away on account of sickness, they are able to take out the trucks themselves and in this way keep the wheels of the delivery equipment always in motion.

Overland Haulage 5.7 Cents per Ton-mile

For the present winter months the trailers have been discontinued, due to the poor condition of the roads. The haulage cost for the trucks alone averages approximately 6.7 cents per commercial ton-mile. The 3-ton trucks in the service average about 15,000 miles a year, making five trips a week or 260 a year with an average trip mileage of 57.7. The cost of operation is about 40 cents per mile. This is equivalent to $6,000 per year or $16.44 per day. This cost includes all charges such as gasoline, oil, tires, repairs, both labor and material, drivers' and helpers' wages, depreciation, interest on investment, insurance, licenses, taxes and garage rent. With a full load of 3 tons in each direction, 57.7 times 6 ton-miles or 346.2 are made each trip. This multiplied by 260 trips gives a total ton-miles of 90,012 per year. This divided into $6,000 gives an average cost of 6.66 cents per commercial ton-mile.

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Standing on Your Own Feet

WITH regard to commercial vehicle exhibits in connection with motor car shows such as held in Kansas City and Boston and in a few other cities, it is time to ask the question, "To be or not to be."

A commercial vehicle show should be big enough to stand on its own feet, rather than being relegated into any part of a show building that is not needed for passenger cars and accessories. We are holding no brief for truck shows, pro or con, but we are trying to look the truck industry squarely in the face, and we are asking ourselves if it is not big and strong enough to stand on its own feet.

Tractors Show the Way

A year ago there was a good example of what it means for an industry to stand upon its own feet. The Kansas City Tractor Club held a show of farm tractors. It did not have enough money to erect a hall or a building and so rented a tent and got an open space of ground in front of the Union Station. There it held the first big tractor show in the country.

The tent was electrically lighted and heated with open fires. It was not the happiest place in the world for a show, but it did demonstrate the Western idea of standing on your own feet. It was not even across the street from the big motor car show held the same week, but more than ½ mile away. It was not even on any main street leading to the big motor car show. It stood off by itself.

Well, the first tractor show was a success. It was held by an organization which had only been formed 6 weeks previously. This year there was a second tractor show in Kansas City. It was held under a larger tent. The tent had a good wood floor. The interior was electrically lighted and heated by open coal fires.

Both shows were wonderful successes. The management was not out for big attendance and was not anxious to fill the newspaper columns with reports of big crowds. It wanted those interested in farm tractors. A nominal admission fee of 25 cents kept the mob out and did not offer any obstacle to any person really interested in tractors.

Now the tractor industry is young, but it has set out on its own way. The tractor people first decided that crowds were not the prime essential to a tractor show. They set out with a second good principle, namely, that if people are interested in tractors they will go to a separate tractor show. They decided thirdly that because a person may go to a motor car show is no reason he is interested in tractors. The Kansas City logic is pretty hard to get away from. After two trials it has struck home. The people interested have attended.

Supposing tractors had taken the basement in the Kansas City motor car show? They would not as an industry be half so large as they are to-day. For 2 years the farm tractor show has stood on its own feet and today there is a national tractor show, just as we say there are national motor car shows, one in New York and the other in Chicago.

But today we have no national motor truck show. We had them at one time, but they are no more. They followed the passenger vehicle shows. Because many dealers could not and did not want to be held up an extra week for the truck show and because many makers did not want 2 weeks of show in New York and 2 more weeks in Chicago, the truck show was discontinued.

It is pretty hard to judge just what was the effect on the motor truck industry. We do know that the truck industry did not plunge ahead as the ability of the truck warranted, and we do know that the present war proved the big stimulator of the truck industry; and lastly we do know that once the war started the movement, the truck has taken on that life which it should have possessed several years ago. This all leads us to the next consideration.

For a Transportation Convention

If not a commercial vehicle show, then why not a commercial vehicle convention? We suggest convention because the term is broader. With a convention you can also have an exhibition and a demonstration. But we are willing to go one step farther and suggest that we have a Transportation Convention. That term should be broad enough to interest nearly everyone. Here is what such a transportation convention might incorporate:

There would be exhibits of motor trucks, trailers, tractors, loading devices, industrial trucks, small vehicle cranes, road-making vehicles, snow-removal devices for motor trucks and a score of other devices having to do with facilitating the handling and transportation of commodities.

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While such an exhibit was being displayed there could be a convention extending over several days. Each day could be designated as being suitable for a certain industry. The subjects of one-day's meeting might deal with department store and merchandising, another day might be devoted to the building and construction trades; a third could be set aside for varied small users, etc. Each day would have a program specially laid out for the trades represented. The convention would be of a practical nature, the papers not academic, but specially practical. There would be broad opportunities for discussion and periods set apart for asking questions. Finally, there might be a series of short sessions where people interested in motor delivery of kindred natures could meet. There would be one group for bakeries, another for shoe merchants, another for florists, another for house-furnishers, etc. These group sessions would continue for several hours, and might be an entire evening would be given up to them. With perhaps a score of such group sessions going on simultaneously there would be ample opportunity for every attendant getting specific information with regard to his own business.

Such a transportation convention might be held the first year in such a center as Chicago. It would have to be held perhaps in the fall during a period when thousands of people from all cities are in Chicago making purchases. Such a week in the mercantile trade is known as buying week. It would be an ideal week for such a convention. The mercantile interests would very gladly co-operate with the motor truck interests in such a movement. It would be to their mutual advantage.

We are convinced that such an annual getting together would be of very great value to the motor truck industry. We further believe that the motor truck industry should get together once a year. It is a great mistake in such a growing industry not to convene once a year. The truck industry should have had its annual convention. They are not only great advertisements to the business, but it is another example of the old argument of strength in union.

Many truck makers are in a national organization, but unfortunately the weaker ones are not. To-day the strong must help the weak. Co-operation of the strong with the weak is needed. In business the chain is as strong as the weakest link, and if the truck industry has a great many weak links, they are millstones around the necks of the strong. It is better for the strong to assist these weaker brethren. The possible field is large enough.

Railroads vs. Inter-city Trucking

OVERLAND freighting by motor trucks has had a wonderful stimulus in the car shortage and railroad congestion during the past 2 years. Concerns in all parts of the country have found the railroads unable to handle short-haul traffic with sufficient expedition and have turned to the motor truck upon the highways as a substitute.

Most great steps in transportation progress are made by compulsion, not by initiative. Transportation engineers have been urging the use of motor trucks for this class of work long and ardently, but business and industrial executives have turned a deaf ear. They let well enough alone. But when the prevailing custom was no longer well enough, but transportation delays and expense became intolerable, they turned to the motor truck as a temporary relief.

Experience with inter-city motor haulage has demonstrated that it makes not only an excellent alternative to short-haul railway transit, but is infinitely superior in many ways. It means but one handling of the goods. It means quick time. It means less breakage. It means less trouble and expense in packing. It means lower transportation cost. In Chicago it is taking 2 weeks to get a carload of goods from one side of the city to the other. Less-carload lots are taking months in transit.

So those industrials who thought that in adopting motor haulage for long distances they were merely adopting a temporary expedient, are finding the service so much superior to railroad transit even in the best of traffic conditions that they are planning to retain motor freighting permanently.

But there is a fly in the ointment. The reason the practice has not made greater progress in some sections which are served by railroad monopolies, such sections as New England, for example, is a deep dread of retaliatory measures by the railroads. This may be surprising to some who have had little experience with railroad business in non-competitive fields, but the fear is very real.

Those who have held off for this reason say that if they should abandon the railroad for intra-state haulage, reserving it entirely for interstate shipping, the effect would be a strange cessation of favors from the railroads in the way of getting cars when needed, of moving loaded cars from their side-tracks and of rushing through much-needed incoming shipments.

Dealers in perishable goods especially dread the effect of incurring the railroad's displeasure. It is not in the power of a common carrier to openly discriminate against its customers, but there are ways many and devious by which it can make its displeasure keenly and perhaps disastrously felt.

According to the testimony of the railroads to the Interstate Commerce Commission, short-haul traffic does not pay at the present rates; yet it seems that they have determined upon an emulation of the policy of Aesop's dog in the manger. One of the surest means of circumventing this unfortunate obstacle to econmy, efficiency and speed in commercial transportation, is for shippers who desire the right to transport their goods in such manner as pleases them to act in combination, for unless they all put their shoulders to the wheel together, the railroad has it in its power to shoulder each one aside separately.

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Michigan Considering Ideal Road Law

Reasonable Restrictions Apply to All Vehicle Types

LANSING, MICH., Feb. 24.—A bill to regulate the weight, weight per inch of tire, speed, size and load distribution of all vehicles, including motor trucks, has been prepared and will shortly be introduced in the legislature of Michigan, which with certain amendments should be a model for other states which wish to enact motor truck legislation. It gives all classes of vehicle a square deal, it is based on sane engineering knowledge, and it provides reasonable penalties and a section to insure its enforcement.

The salient features are that it applies to all vehicles, horse and motor alike, exempting motor buses, farm machinery and road-building appliances. It limits the gross weight to 15 tons, the rear axle weight to 75 per cent of that amount, the wheel track to 75 inches, the total width to 8 feet, and the total height to 12½ feet. The speed limits are reasonable, yet not too liberal, that for a 5-tonner being 14 miles per hour if provided with 36-inch wheels.

Unusual requirements are that according to the wording of Section 8 the rear axle may not sustain more than three-quarters of the gross load. Improved roads in bad condition may be protected by posting signs restricting the weight to half that ordinarily allowed. It permits the use of chains but makes the user liable for any damage done to so-called improved roads regardless of their condition. Trucks are required to carry plates stating the wheel height, the tire width, the wheel track, the weight of the vehicle and the carrying capacity.

In the schedule of tire loads, horse vehicles are restricted to 600 lbs. per inch of width, motor vehicles approximately to 800 lbs., or the normal supporting capacity of rubber tires, which are practically required in the bill.

One fault in the bill is that in the schedule of allowable weights, single tires only up to 7 inches in width are taken into account. The allowable speed on a single tire is slightly higher than that on a dual, quite rightfully, but no allowance is made for the man with a 10, 12 or 14-inch single tire.

The bill is now under consideration by the legislature and was prepared by the State Highway Department of that state. From a careful reading of its provisions, it is evident that it is the best bill regulating commercial vehicles so far given consideration, and if passed would serve as a very useful model for similar legislation in other states. The bill follows:

THE PEOPLE OF THE STATE OF MICHIGAN ENACT:

"Section 1.—It shall be unlawful to operate any vehicle upon the public highways of this state, the gross weight of which exceeds 15 tons.

"Section 2—It shall be unlawful to operate any vehicle, except motor-driven vehicles, upon the highways of this state, the gross weight per inch width of tire of which exceeds 600 pounds.

"Section 3—In case a vehicle is equipped with a braking device said brakes shall be of a friction type and not of a type that will cause a deadlock of the wheels when applied.

"Section 4—No motor trucks or trailers, hereafter operating upon the public highways of the state shall have a gauge of more than 75 inches measured from center of tire to center of tire, and shall not be more than 96 inches wide overall nor over 12 feet 6 inches in height.

"Section 5—No motor trucks or trailers, hereafter operating upon the public highways of this state shall be equipped with driving wheels the tires of which are of metal that may come in contact with the surface of the road or which have a partial contact of the metal with the surface of the road, except where chains or other non-skidding devices are used; Provided, That should any improved highway be damaged by the use of chains or other non-skidding devices, the person, company or corporation owning or operating such vehicle, shall be liable to arrest and penalties as hereinafter provided.

"Section 6—The following limits of sizes, weights and speeds of motor trucks and trailers shall be effective within this state for use upon the public highways.

SCHEDULE FOR THE REGULATION OF MOTOR TRUCKS AND TRAILERS UPON THE HIGHWAYS

Table for a Wheel 32 In. in Diameter.

Size of Tire in Inches	Single Tire—Maximum Wheel Load in Pounds	Single Tire—Miles per Hour	Double Tire—Maximum Wheel Load in Pounds	Double Tire—Miles per Hour
2	700	20	1,400	18
2½	900	20	1,800	18
3	1,200	20	2,400	18
3½	1,600	20	3,200	16
4	1,900	18	3,800	14
5	2,200	16	4,400	13
6	2,700	14	5,400	12
7	3,200	12	6,400	10

For a 34-inch wheel, multiply the above max. wheel load figures by 1.1.
For a 36-inch wheel, multiply the above max. wheel load figures by 1.2.
For a 38-inch wheel, multiply the above max. wheel load figures by 1.3.
For a 40-inch wheel, multiply the above max. wheel load figures by 1.4.
For a 42-inch wheel, multiply the above max. wheel load figures by 1.5.
For a 44-inch wheel, multiply the above max. wheel load figures by 1.6.

"Section 7—All motor trucks or trailers, now operating or hereinafter placed in operation, upon the public highways of this state shall have placed upon them information relative to their height of wheel, width of tire, gauge, width over all, weight, and carrying capacity. This information shall be conspicuously placed on the vehicle.

"Section 8—On the rear axle three-quarters of the gross weight of a motor truck or trailer and its respective carrying capacity must be within the limits of the schedule of the respective diameters of wheel, size of tire, and speed per mile, as shown in the schedule under Section 6 of this act.

"Section 9—The front axle shall carry the remainder of the weight of a motor truck or trailer and load combined, and must be within the limits of the schedule for single tires under Section 6, this act.

"Section 10—This act shall apply to motor trucks or trailers used as buses for carrying passengers.

"Section 11—This act shall not apply to farm implements or machinery used in road construction.

"Section 12—The size of tire and height of wheel shall be taken as that size printed upon tire by the manufacturer.

"Section 13—Providing, That when a truck is hauling a trailer, the speed shall be governed by the vehicle having the lowest mile per hour rating.

"Section 14—During the months of March, April, and May if, by reason of the thawing of frost or rains, the roads are in soft condition, the maximum carrying capacity of tires on all vehicles shall be limited to one-half the carrying capacity of tires as provided in this act. If at any other time any county, district, or township highway commissioner deems it necessary by reason of the soft condition of the roads to put the provisions of this act in force, he shall post notices on all improved highways to such effect, along with a copy of this section of this act.

"Section 15—Any person, firm or corporation which moves or causes to be moved any vehicle over or along the public highways contrary to the provisions of this act is guilty of a misdemeanor, and on conviction thereof before a justice of the peace or other court having competent jurisdiction shall be subject for each offense to a fine of not less than $5 or more than $50, or imprisonment in the county jail for not to exceed 30 days, or both fine and imprisonment, at the discretion of the court; Provided, That the provisions of this act shall not apply to the moving of any vehicle for which a permit has been granted by the highway officials having jurisdiction. Any permit so given shall state all conditions thereto, shall be in writing, and shall have effect not longer than 30 days from the date issued.

"Section 16—It shall be the duty of the sheriff of each county to cause to be made as his deputies all county, district, and township highway commissioners and other where necessary, and these deputies shall have power to arrest on sight or upon a warrant any person having violated any provisions of this act. Any such deputy who shall willfully disregard enforcing the provisions of this act shall be guilty of neglect of duty."

Coming Commercial Vehicle Events

March 3-10.....Boston, Mass., Fifteenth Annual Motor Vehicle Show, Mechanics' Building.

March 6-10.....Brooklyn, N. Y., Motor Truck Show, Twenty-third Regiment Armory.

March 20.....Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.

March 20.....Philadelphia, Pa., Monthly Meeting, Pennsylvania Section, S. A. E.

March 21.....New York City, Annual Beefsteak Dinner of the Motor Truck Club of America, Churchill's, Broadway at Fiftieth Street.

March 21.....Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.

66% Growth in Empire State Trucks

Now 34,653 Commercial Vehicles in State of New York

NEW YORK, Feb. 18—Commercial motor vehicles increased 66 per cent in number in New York State during 1916 over the year previous. Secretary of State Hugo reports that there are 34,653 of these vehicles in the State now as against 20,880 listed at the close of 1915.

ALCOHOL FROM SAWDUST

MADISON, WIS., Feb. 28—Grain alcohol derived from sawdust is being tried out as a substitute for gasoline in motor vehicles by Canadian experimenters, according to officials of the federal forest service in this city.

Wood waste can be broken down to wood alcohol and readily converted to grain alcohol, according to these authorities.

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Federal Bringing Out 1- and 5-tonners

Changes Made in Design, Motors of Special Type Used

DETROIT, Feb. 26—New Federal truck models have just been put on the market and will be exhibited at the Boston show for the first time. The capacities range from 1 to 5 tons, and two of these are new for the Federal company. These are the 1- and 5-ton models. The others are new models also, but are refinements of the previous designs. They have capacities of 1½, 2 and 3½ tons. These five models use three different motor sizes; one for the 1-ton, one for the 1½- and 2-ton, and the other for the 3½- and 5-tonners. The motors are Federal designs and are similar throughout, as are the chassis of all five truck models in all important particulars. There are a few variations, however, which are necessitated by the difference in capacities. The most notable difference is that the trucks all have four-speed gearboxes, except the 1-ton truck, which has three speeds. The 5-ton model is equipped with steel wheels with hollow spokes, whereas the smaller models are fitted with artillery wood wheels.

The prices of the chassis are as follows: 1-ton, $1,650; 1½-ton, $2,100; 2-ton, $2,300; 3½-ton, $3,000, and 5-ton, $4,000.

UNIVERSAL TO MAKE FOUR-WHEEL DRIVERS

OSHKOSH, WIS., Feb. 17—The Universal Motor Co., maker of Universal trucks, will put out a four-wheel-driven truck in the near future. The design which the company will follow embodies, among other features, three differentials to give complete compensating effect.

NOBLE A NEW 2-TONNER

SOUTH BEND, IND., Feb. 27—The Noble Motor Truck Co. has been organized at Kendallville, Ind., with a capital stock of $30,000. The company will make a motor truck with a capacity of 2 tons at the start, and will offer other models later. C. J. Munton is president, H. L. Postel, vice-president, G. M. Patterson, secretary, H. W. Bradtmiller, treasurer.

DURABLE A NEW TRUCK

SOUTH BEND, IND., Feb. 26—The Durable Motor Truck Co. has been organized at Hammond, Ind., with a capital stock of $500,000. A factory building has been purchased and the concern will start manufacturing small trucks at once. The officers of the new company are Joseph Studor of Whiting, Ind., president; Charles A. Foss of West Hammond, Ind., treasurer; C. Brown, secretary.

MACKBILT NEW TRUCK

NEW YORK CITY, Feb. 24—Mackbilt is the name of the new ¾-ton truck designed by W. C. Mack, and manufactured by the Metropolitan Motors, Inc., New York City. It has a four-cylinder, 3¾ by 4¼ engine of the L-head type, cylinders cast in block, and water cooled by means of thermo-syphon circulation. The price is $895.

The oiling system is by forced feed, using a plunger pump.

The motor is fitted with Eisemann or Dixie magneto and a Master carburetor. It develops 36.9 hp. at 2800 r.p.m.

The transmission is of the unit power-plant type, with center control and three speeds. The main shaft is mounted on ball bearings. The clutch is of the single plate type with two asbestos wire woven friction discs.

The rear axle is the semi-floating type. The bevel final drive has a gear reduction of 6 to 1. The driving torque is taken by a torsion arm.

The brakes are fitted to the rear wheels on 14 7/16 in. by 2 in. drums. The emergency brake is of the internal expansion type, and the foot brake of the external-contracting variety.

DODGE BROS. TRUCK PROJECTED

DETROIT, Feb. 18—Dodge Bros. are preparing to put a light truck on the market. The preliminary designs have been made and a few experimental models will be made up and given exhaustive road tests before the final type is decided upon. Reports which have been circulated that the company has already put out a truck are unfounded. A few chassis have been furnished which are the same as stock passenger cars except for oversized tires and heavier springs with a special form of shroud flush with the windshield.

The truck under consideration will probably not exceed 1,000 lbs. capacity and will be intended for light delivery work.

ONEIDA TRUCK COMING

CHICAGO, Feb. 28—(Special telegram to THE COMMERCIAL VEHICLE)—The Oneida Motor Truck Co. was organized in Green Bay, Wis., yesterday with $300,000 capital to manufacture a new truck in 1-, 1½-, 2- and 3½-ton sizes. The concern is backed by local business men and contemplates eventual large production. Factory facilities have already been provided. L. P. Fortin, formerly sales and advertising manager of the Menominee Motor Truck Co., is director of sales and advertising and G. A. Lindstrom, formerly superintendent of the Monominee concern is factory superintendent. His pneumatic radiator shock absorber will be incorporated in the trucks to be built.

R. E. TAYLOR GETS NEW QUARTERS

NEW YORK CITY, Feb. 22—New quarters at 614-620 West Fifty-seventh street have been secured by the R. E. Taylor Corp. The expansion is the result of the contract of the company to distribute Gramm-Bernstein trucks in the entire East, as announced in THE COMMERCIAL VEHICLE for Feb. 1. The Taylor company previously handled the Garford line in the same territory.

A service station as well as display and salesrooms will be provided at the new location which affords 34,000 sq. ft. of floor space. The rooms are near Twelfth avenue in the heart of the trucking district. The Brooklyn rooms are at 338-340 Flatbush avenue; the Boston, Mass., quarters across the Charles river from the city in Cambridge, and the Philadelphia offices at 1540-1542 Callowhill street. The executive offices of the corporation remain in the Brokaw building, New York.

Republic Interested in Torbensen Axle

Acquiring Financial Control —No Interference with Orders

ALMA, MICH., Feb. 19—The Republic Motor Truck Co. is arranging a plan to obtain control of the Torbensen Axle Co. of Cleveland, Ohio. The plan will allow the Torbensen company to continue the manufacture of axles for practically any concern that wants to purchase them.

As arranged, the plan calls for an increase of capital stock in the Republic company whereby 15,000 shares of new stock would be offered to stockholders at $100 per share. The Republic company expects to secure control of all the issued common stock of the Torbensen concern, of which there are 7500 authorized, par $100, and 3950 outstanding. There are also 10,000 shares of $100 par preferred of which 5000 shares have been issued.

It is stated that this deal will give the Republic company control of the only internal-gear patents in existence. The management of the Torbensen company will remain as heretofore.

U. S. TRUCK CO. ADDING

CINCINNATI, OHIO, Feb. 24—An additional space of 500 by 98 sq. ft. for use in the final assembling of trucks has been secured by the United States Motor Truck Co., a subsidiary of the Stewart Iron Works, this city. The company in its present quarters can put through 100 trucks at one time in the assembly department. The enlargement of space will enable 200 trucks to be put through at the same time. The added room is in the Stewart Iron Works plant.

FULTON TRUCK INCREASING FACTORY

FARMINGDALE, L. I., Feb. 22—The Fulton Motor Truck Co. will start building a 40,000 sq. ft. addition to its plant at once. This will double the present capacity. The company, which has been working on the basis of 1000 chassis for 1917, will double the output. At present it is working 24 hrs. daily, turning out 1½-ton internal-gear-driven trucks.

BANKERS' TIME-PAYMENT PLAN

NEW YORK CITY, Feb. 25—Information for dealers and distributers showing how they may arrange for time payments on motor vehicles and carry out other legal transactions has been compiled in a neat and serviceable booklet by the Bankers Commercial Corp. of New York. The booklets are being sent in large lots to manufacturers who send them out to their distributers.

COVERT MOVES TO DETROIT

LOCKPORT, N. Y., Feb. 25—Detroit will be the address of the Covert Gear Co. after March 1. The change from Lockport to the motor vehicle manufacturing center has been made because the company believes it will be advantageous to be at the heart of the industry. The new quarters are at 967 Woodward Avenue. A. A. Gloetzner will handle all departments in the future. He was formerly sales manager.

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Pierce-Arrow Earnings $4,000,000

Second Most Prosperous Season, $301,000 Under 1915

BUFFALO, Feb. 26—The Pierce-Arrow Motor Car Corp. in 1916 earned over $4,000,000 after all depreciation charges. This is equivalent to $12.80 a share on the 250,000 shares of common stock outstanding, no par value, after allowing for 8 per cent dividend requirements on the $10,000,000 preferred stock outstanding. Profits of $4,000,000 in 1916 compare with $4,301,000 in 1915. Comparison of earnings in recent years is made below:

1916 calendar year	$4,000,000
1915 calendar year	4,301,000
1914, 18 months' period	1,714,000
1913, June 30, year	1,464,000
1912, June 30, year	2,142,000

COSTS CUT GOODRICH PROFITS

AKRON, Ohio, Feb. 24—High labor and material costs have cut down the net proceeds of the B. F. Goodrich Co. in 1916 to less than the profits of the year preceding to the extent of $2,211,509, despite the fact that the gross sales increased $15,573,914 during the same period.

The net profits for the past year, according to the report just issued by the company, amounted to $10,379,449 as against $12,590,958 in the year before. The net sales were $70,990,781 in 1916, and in 1915 they were $55,416,867. The operating expenses jumped from $42,825,909 in 1915 to $60,611,332 in 1916. Other income than that figured in the net profits amounted to $235,461 in 1916 and $467,691 in 1915, which makes the total net income for 1916 $10,614,910 and for 1915 $13,058,649. The deductions in 1916 were $1,046,145. The preferred dividends paid amounted to $1,911,000 and the surplus to $7,657,764. The per cent paid on the common stock was 12.59 as against 17.17 in 1915.

Bills payable amounted to $6,503,515 or more than 4 million dollars increase over the previous year. This jump is attributed to the large increase in inventories due to a greater volume of business, and congested markets and transportation. Total current liabilities are $8,516,991 against net quick assets, exclusive of inventories of raw materials, of $9,280,151. Cash on hand on Dec. 31, 1916, amounted to $1,514,241.

The company added extensions and equipment to its plant during 1916 costing $3,519,550.

WISCONSIN MOTOR CAPITAL INCREASED

MILWAUKEE, WIS., Feb. 27—The Wisconsin Motor Mfg. Co., Milwaukee, Wis., has increased its capitol stock from $350,000 to $1,000,000 and started work on plans for the enlargement of its factory at Forty-seventh avenue and Burnham street, which will make possible an increase of from 50 to 75 per cent in its output.

The increased capital is the result of the declaration of a stock dividend of 100 per cent, in addition to the regular cash dividends, at the annual meeting of the company. The issue of $1,000,000 is divided between $700,000 common and $300,000 in 7 per cent preferred stock.

The Wisconsin company's customers for truck and tractor engines have placed largely increased demands upon the plant.

STANDARD PARTS GETS BOCK

CLEVELAND, Feb. 24—The Standard Parts Corp. of this city has purchased the factories and business of the Bock Bearing Co., of Toledo. The Standard Parts Corp. owns the Perfection Spring and Standard Welding companies and is negotiating for the purchase of the Western Spring & Axle Co., which has plants in Ohio and Michigan.

DIAMOND-T TOURIST AT TULLAHOMA, TENN.

TULLAHOMA, TENN., Feb. 22—There is no thoroughfare at present over the Dixie Highway from Tullahoma, Tenn., to Chattanooga, Tenn., according to Jim Phillips and Bill Paull, who are driving a 2-ton Diamond-T truck from Chicago to Tampa as a demonstrating stunt. Heavy rains and slush have made the road beds bad, and the highway at parts of the Cumberland mountains is impassable.

REDDEN ADAPTER EXPANDING

CHICAGO, Feb. 21—Twenty branch assembly plants in twenty of the largest cities of the United States are to be established by the Redden Truck Co. as the basis of the new $4,000,000 organization. The main factory will be located in Jackson, Mich., it has been decided, and the assembling and distribution will be taken care of at the twenty branches.

The company was recently organized to manufacture the Redden truck-maker, used for converting passenger cars into 1-ton trucks. The device is patented by Albert E. Cook.

The men chiefly interested in the project are Horace DeLisser, Ajax Rubber Co., New York; H. W. Cowan, C. A. Bickett, president of the Chicago Metal Bearing Co.; L. B. Patterson, Chicago banker, and W. K. Pritchitt, of Pritchitt & Co., bankers, New York.

TEN MAKES OF TRUCKS SHOWN AT SYRACUSE

SYRACUSE, N. Y., Feb. 24—Ten makes of trucks were shown at the Syracuse motor vehicle show which closed here tonight. The makes shown were the Acme, Brockway, Chase, Larrabee, I. H. C., Studebaker, Sanford, Overland, Mack and Reo. The Troy Trailer was also on exhibition and two firms showed commercial bodies for use on Fords.

SIXTEEN TRUCKS AT HARTFORD

HARTFORD, CONN., Feb. 17—Sixteen makes of trucks were represented at the Hartford motor vehicle show held here this week. The Federal, Denby, Riker, Ford, G. M. C., White, Jeffery, Vim, Pierce-Arrow, Packard, Republic, Kisselkar, Reo, Overland, Autocar and Maxwell were shown. The Smith Form-A-Truck also was on exhibition.

Gotham Solons Squelch All Bus Offers

Refuse to Take Definite Action After Approval of Plans

NEW YORK CITY, Feb. 19—Two more petitions for motor bus franchises have been shelved by the franchise committee of the board of estimate of New York City. The Fifth Avenue Coach Co. and the New York Motor Bus Co. are the concerns seeking the privileges. Although no definite refusal has been given, so far as can be learned, the action on the petitions is being indefinitely postponed. According to the Mayor, the city experts have decided that the bids now pending would not compensate the city sufficiently, and in view of this attitude on the part of the authorities, any immediate relief in the motor bus situation appears unlikely.

One of the companies was approved over a year ago by the franchise committee, but its rival and the subway also protested. Then the rival put in a supplementary bid. No further action was taken by the board of estimate on the situation. Due to the overcrowding of all the transit lines in the city and the relief that any additional facilities would afford, the franchise question has become a big issue, and the opponents of the administration are threatening to make it one of the chief points of the campaign unless something is done shortly.

MOLINE-KNIGHT MOTORS IN CHICAGO BUSES

EAST MOLINE, IND., Feb. 25—Moline-Knight engines will be used in the fifty new buses of the Chicago Motor Bus Co., which will be put into service in about 10 weeks.

PUSH THE WEBB BILL

NEW YORK CITY, Feb. 25—Quick work is needed to get the Webb bill before the Senate during this session of Congress, and the National Foreign Trades Council, together with other interested associations, is urging that the public telegraph or write the Senate committee on interstate commerce to report the bill.

The measure aims to legalize the combination of American industries for foreign trade. At present American companies hesitate to combine for this purpose due to the Sherman anti-trust law, and are therefore at a disadvantage in competing with the European trusts.

The bill has the support of President Wilson, the Federal Trade Commission, the U. S. Chamber of Commerce, of nearly 600 commerce chambers in the country and many other business associations.

The bill has been up before the Democratic caucus in the Senate, and as opposition was threatened the committee has not introduced it. The chairman of the committee is Senator Newlands, other members are Smith, Myers, Saulsbury, Lewis, Underwood, Cummins, Townsend, Poindexter, Pomerene, Robinson, Thompson, Gore, Capp, Lippitt, LaFollette and Brandegee.

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War Brides Not to Be Made in U. S. A.

War and Commerce Heads Arrange to Prevent Excess Profits

WASHINGTON, D. C., Feb. 21—No war profits will be derived by motor truck or munitions manufacturers as a result of any conflict between the United States and any foreign Power. This decision has been reached by many manufacturers and it will be safeguarded by committees from the National Chamber of Commerce co-operating with the Council of National Defense. Secretary of War Baker has written President Rhett of the National Chamber, and an arrangement has been made so that the War Department may know what is a just price for commodities based on a peace-time standard of profit.

TRUCKS FOR WAR POLICE

NEW YORK CITY, Feb. 20—Motor trucks in abundance will be at the disposal of the New York police department in the event of war. The Consolidated Gas Co. has promised forty-five vehicles; the New York Edison Co. will provide forty-nine, and the United Electric Light & Power Co. will supply forty-one.

The numbers offered were more generous than given above, but Police Commissioner Arthur Woods has accepted the above quota from each firm with the understanding that more trucks will be provided if necessary.

TRAINING WOMEN FOR TRUCK DRIVERS

NEW YORK CITY, Feb. 17—Women are being trained in New York to run motor buses in order that they may replace men in the event of war. The classes are being held at the West Side Y. W. C. A. under the auspices of Mrs. L. Wolcott Thomas, 27 East Sixty-second street.

Mrs. Wolcott is chairman of the motor division of the National League for Woman's Service. The league has headquarters at 38 West Thirty-ninth street, in charge of Miss Maud Wetmore. The first efforts of the society will be directed especially to organizing a large reserve corps of women truck drivers.

MOLINE-KNIGHT MOTORS FOR WAR TRUCKS

EAST MOLINE, ILL., Feb. 23—The Moline-Knight engine has been selected by the British Government for use in the war trucks being built at Camp Borden, Canada.

100,000 ARMORED TRUCKS IN EUROPE

PHILADELPHIA, PA., Feb. 21—One hundred thousand armored trucks are being used by the armies of Europe, said J. A. Steinmetz, in his address to-night before the Philadelphia section of the S. A. E. He spoke on "The Automotive in War" and deplored the lack of co-operation between the United States Government and its citizens in providing adequate weapons of defense.

Foreign governments help individuals to work out their patents, the speaker stated, whereas the Americans must finance their experiments out of their own pockets.

Wire wheels are being used on most of the light armored trucks, as they minimize the danger of having spokes broken under shell fire.

2 MILLION AMERICAN HORSES SOLD ABROAD

NEW YORK CITY, Feb. 24—America is now literally in the midst of the horseless age, according to John F. Ryan, who is an executive in the Canadian Breeding Bureau, the Overseas Export Co. of Canada, and the International Export Co. of New York. Europe has bought out the American horse market for use in war, says Mr. Ryan. He states that France and England have taken 1,815,000 horses from here since 1914, that Italy has secured 160,000 and the Greeks about 30,000.

TO BUILD GOOD ROAD DETROIT TO TOLEDO

DETROIT, Feb. 22—Work will be started in March on the Rockwood-Monroe link in the roadway from Detroit to Toledo. The unusual number of vehicles driving out from Detroit, due to the freight car shortage, has measurably increased the importance of this highway. The construction, planned over a year ago, by Detroit motor vehicle manufacturers and backed by them to the extent of $42,000, has been delayed due to differences between the officials of Monroe County and the contractor. These have been straightened out, however. The bed will be of concrete and 16 feet wide. The Toledo Chamber of Commerce has contributed $13,000 to the project.

WESTERN CREDIT TRUCK SALES BRANCH HOUSE

CHICAGO, Feb. 24—All time-payment business conducted by the Guaranty Securities Corp., New York City, in the Middle West and Rocky Mountain section will be handled after March 1, through its agent, the recently organized Guaranty Banking Corp. of Chicago. The parent company finances motor vehicle dealers in order that they may sell on credit, or so that they may obtain cars for storage and display on credit. The new house will specialize in motor vehicle finance, but it is regularly incorporated as a State bank under the Illinois law, and will conduct a general banking business.

E. S. Maddock is president, Paul Fitzpatrick vice-president, H. L. Wynegar vice-president and manager, Joseph M. Eberhardt cashier, L. S. Coyle assistant cashier and F. A. Franklin auditor.

CONVICT ROAD LABOR INCREASES

WASHINGTON, D. C., Feb. 17—Ten times as much of the labor on public roads is now being done by convicts than was done by this class of labor in 1885. The report of the U. S. Department of Agriculture shows that convicts are being increasingly employed for the construction of public works. From 25 to 50 per cent of male prisoners are physically fitted for this occupation. In 1885, 1.3 per cent of the road builders were convicts. The percentage has increased to about 13 in 1917.

Urge Plans to Relieve N. Y. Terminals

Anti-congestion Measures Would Permit Greater Truck Use

NEW YORK CITY, Feb. 25—Several plans to relieve the freight situation in New York City are being brought forward while the New York Central contract with the city is undergoing revision. Irving Bush proposes a central railroad clearing terminal at Bayonne, N. J., which would employ floats to move the freight to various points in Greater New York, thus avoding traffic across the congested parts of the city.

Terminal points suggested by the New York Institute of Public Service are Fifty-ninth street at the Hudson River, at Manhattan Street and One Hundred and Thirty-fourth Street, at Spuyten Duyvil, at Forty-second, Thirty-second, Twenty-third and Fourteenth Streets, on the East River front, and at the Brooklyn Marginal Railroad transfer point. At present the railroad piers are crowded along the Hudson between Twenty-third and Forty-second streets. If the present contract is signed by the city, the New York Central will control the Hudson River front north of Fifty-ninth Street.

JEFFERY QUADS DELIVERED BY ROAD

KENOSHA, WIS., Feb. 24—Express service is being used by the Nash Motors Co. to get Jeffery Quads to some of its dealers, due to the tie-up of freight service. Shipments have been made in this way from Kenosha to Brookville, Pa., and to Youngstown, Ohio. Boston, Mass., is solving the situation by ordering trainload lots.

STUDEBAKER SHIPPING BY ROAD

DETROIT, Feb. 24—Wholesale drive-aways are now the regular order of the day at the Studebaker factory. The company, together with its competitors in the industry, has found it next to impossible to get any sort of rolling stock from the railroads to carry its products, and hence all vehicles for dealers in a 400 to 500 mile radius are leaving the factory under their own power.

CHAMPION SHIPS BY WATER

FULTON, Ill., Feb. 24—An all-the-way-by-water route is being used by the Champion Motors Co., of this city and Cleveland, to get around the freight car shortage difficulty in shipping vehicles to the eastern coast and to export ports. The company is sending trucks down the Mississippi to the Gulf and is shipping them abroad from gulf ports.

AVOID SOUTH BEND IN ROAD DELIVERIES

SOUTH BEND, IND., Feb. 24—Dealers who are driving their motor vehicles from Michigan factories east will have to have an Indiana license passing through South Bend. A number of arrests have been made here recently. An effort is being made to have the Legislature exempt from license motor vehicles which are being driven through the state to the markets in which they will be sold.

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The Boston Show

Thirty-nine Makes of Trucks, Fourteen Making Their Boston Debut, Will Be Put on the Counter for New England Merchants to Inspect First-hand, Compare and Choose From for Their Haulage Work During the Year 1917

REFLECTING the great prosperity which New England has enjoyed during the past year, this year's Boston motor vehicle show will have a larger number of makes of trucks exhibited than in 1916. Thirty-nine different makes of commercial vehicles in addition to three or more types of Ford adapters will be shown as against thirty-seven makes of trucks exhibited last year.

As has been the practice since 1914, this year's truck showings will form a part of the annual combined passenger car and motor truck show. As formerly, the trucks will be exhibited in the basement of Mechanics Building. The show will be held during the week from March 3 to March 10, inclusive. This year's exhibition will be the Sixth Annual Commercial Vehicle Show promoted by the Boston Commercial Motor Vehicle Assn.

According to data obtainable at this writing, this year's truck show will be not alone larger than last year's exhibit but also larger in the number of makes put on the New England counter than the last exclusive commercial vehicle show held in Boston in 1914.

New trucks to be exhibited will include the Federal 5-tonner, which will make its debut to the conservative buying public of New England. Although the full specifications of that vehicle were published in full in the November 1, 1916, issue of THE COMMERCIAL VEHICLE, the Boston show will serve as a means of putting it actively on the market.

Fourteen New Exhibits

Other trucks to be exhibited which were not among those present at last year's gathering will include the following: Atlas, Atterbury, Brockway, Duplex, F. W. D., G. M. C., Gramm-Bernstein, Hurlburt, Kisselkar, Krebs, Mackbilt, Maxwell and Overland. In addition to these new makes of trucks, the Martin Rocking Fifth Wheel Co. and the Holland Trailer Co. will have exhibits for the first time.

According to the latest reports those trucks which were shown last year and which are not included among the exhibits for 1917, will include the Buick, now no longer made in delivery models; the Fostoria light car, also discontinued; the Knox tractor, the United and the Ward electric.

Although these exhibits may be slightly altered before the show opens its doors on Saturday, March 3, it would appear that fourteen new makes of trucks will be shown, and that five makes exhibited last year will be among those missing for 1917, leaving a net gain of nine new exhibitors for this year. New trucks exhibited for the first time in a regular show, not including hotel parlors, will include the new Mackbilt vehicle and the Maxwell in addition to the Federal 5-tonner previously mentioned.

With this large array of thirty-seven makes of trucks put up on view, New England commercial vehicle buyers will have an unprecedented opportunity of examining the vehicles first hand instead of trying to make mental pictures of them with the aid of photographs or making a time-consuming trip to all of the makes actively represented by branches or dealers in the Boston territory.

Boston Show for All New England

In this connection it must be remembered that while the show is held in Boston, it is really an all-New England exhibition. Prospective buyers and dealers from all of the New England States will attend, for all things gravitate to Boston, the Hub of New England. Merchants and manufacturers from Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and the upper half of Connecticut have attended the Boston truck shows in the past, and all indications point to this year being no exception to the rule.

If this year's show is anything like those which have preceded it for the past 3 years, there will be many novel types of truck bodies shown. Bodies played an important part in last year's show and revealed the New England market. Of the 120 chassis shown last year, eighty-one were equipped with bodies. Many of these were of the convertible type, that is, those which may be used in more than one kind of business with equal success.

Many Special Bodies Will Be Seen

New England truck buyers are now well educated in the operation of motor trucks, and realize that trucks must be kept in actual motion over the roads for the greatest possible time each working day if they are to give the most efficient results. This experience has made them very keen for bodies which may be converted for other work or bodies which facilitate quick loading and unloading. Many of the bodies exhibited last year also made use of the great advertising possibilities of motor trucks, and it is almost certain that many new types will be shown this year that will prove of almost as much interest to owners as some of the older and well-standardized makes of trucks in which no major changes have been made.

New Truck Advertising Plan

As a concrete example of the alertness of Boston merchants to the great advertising value of motor trucks, a concern has just been formed there which will employ a fleet of ten trucks with electrically-illuminated signs. These vehicles will do nothing but run around the city for 10 hours every day. Each truck will carry ten different advertisements, shown one after the other at 5-second intervals. The advertisements are painted on specially-prepared curtains 8 feet long and 5 feet high. These curtains are so arranged that they appear for 15-second intervals through the glass sides of the special body. Each curtain appears first on one side then at the rear and then on the other side, the change between different advertisements being made when the interior illumination is temporarily shut off.

The appearance and disappearance of the curtains are intended to arouse

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curiosity and incite interest as to the nature of the next one to appear. The use of motor trucks for this purpose by a concern which makes it its sole business is a new departure, and one which seeks to bring the products advertised directly to the attention of the public instead of having the public seek out the advertising.

The Plan of Operation

The trucks will run intermittently for 10 hours a day, from 10 a.m. until midnight, and will traverse the most important thoroughfares in the city. The advertising space for the ten trucks to go into service in Boston has already been contracted for. The concern plans to branch out into other cities and to put twelve similarly-equipped trucks into service in New York City and Brooklyn. Ultimately it plans to operate a fleet of 175 trucks in large cities throughout the United States.

Each of the trucks is supplied with special low gear reductions for the slow speed work and will have a special generator for the Philadelphia storage battery of 26 volts and 110-ampere-hour capacity. The current supplied will be used to light fourteen Johns-Manville Linolite lamps. An Entz generator with a specially-rewound integral starter will be employed. This will keep the battery charged at a vehicle speed of 5 m.p.h. A fuller description of this installation, which is owned by the New England Auto Bill Post, Inc., Boston, will be published in a subsequent issue of THE COMMERCIAL VEHICLE, together with illustrations of the vehicles and the manner of operation of the signs.

Overland Haulage Increasing

This year's show should prove of great value to many of the New England manufacturers seeking some new means of surmounting the present poor railroad service along the Atlantic seaboard. Many such concerns have already installed trucks in this work, one such example being the Warner Bros. Co., Bridgeport, Conn., whose truck fleet and its method of overland operation is fully described and illustrated in the leading article of this issue. The experience of that concern, its cost figures and its findings regarding the use of trailers on 40-mile overland hauls, should prove of value to other concerns confronted with like problems.

The Boston truck show, continued during 1913 and 1914 as a separate truck show and since then as a portion of the passenger car show, even after the truck shows in New York City and Chicago were discontinued in 1912, has been made possible principally because it has served all of New England instead of just Boston alone. This has been due to the geographical position of Boston at the very hub of all New England. Within a radius of 75 miles from her city hall are most of the largest cities of Massachusetts, Rhode Island and New Hampshire. All of these are within a day's run from Boston.

Boston herself is not a great truck center, paradoxical as this may seem. This is because her streets are narrow, poorly paved and very much congested. Of Massachusetts 18,914 trucks at the end of 1916, only approximately 4000 were registered in Boston. The remaining 14,000 trucks are maintained within close proximity to Boston, and this makes her an ideal place for a show to serve all of the New England territory. The great textile beehives of Massachusetts, Rhode Island, Connecticut and New Hampshire are all within the 75-mile circle drawn about Boston as a center. The center of the boot and shoe industry, the world's largest, is at Boston's back door. Similarly, the hearts of the great hat, paper and hardware industries are within easy reach of Boston by motor truck. In fact, with Boston as a center, all of New England is accessible by motor truck.

Boston New England's Center

Aside from the great manufacturing industries within a day's run from Boston, the population within a radius of 50 miles is calculated to represent one-fifteenth of the purchasing power of the country. This is because of the great density of population in the Boston territory, for, as reported in the December 15, 1916, issue of THE COMMERCIAL VEHICLE, there are 2,038,123 souls within a 25-mile radius and 3,470,587 within a 50-mile circle.

Boston, Mass., Truck Exhibits

Trucks of Thirty-nine Makes Will be Shown—Who They Will be Exhibited by

	Truck	Maker	Maker's Address	Exhibitor	Exhibitor's Address
1	Atlas	Martin Carriage Wks	York, Pa	Fred Henderson	Boston, Mass.
2	Atterbury	Atterbury Motor Car Co	Buffalo, N. Y.	Atterbury Motor Car Co	Buffalo, N. Y.
3	Autocar	Autocar Co	Ardmore, Pa	Autocar Sales & Service Co	Boston, Mass.
4	Brockway	Brockway Motor Truck Co	Cortland, N. Y	Brockway Motor Truck Co	Cortland, N. Y.
5	Commerce†	Commerce Motor Car Co	Detroit	Commerce Motor Car Co	Detroit, Mich.
6	Cunningham	James Cunningham, Son & Co	Boston, Mass	James Cunningham & Son Co	Boston, Mass.
7	Denby	Denby Motor Truck Co	Detroit	Denby Motor Truck Co	Detroit, Mich.
8	Diamond-T	Diamond-T Motor Car Co	Chicago		Boston, Mass.
9	Duplex	Duplex Power Car Co	Charlotte, Mich	Duplex Truck Co. of Boston	Boston, Mass.
10	Federal	Federal Motor Truck Co	Detroit, Mich	Boston Federal Truck Co	Boston, Mass.
11	F. W. D	Four Wheel Drive Auto Co	Clintonville, Wis	Four Wheel Drive Co	Boston, Mass.
12	G. M. C	General Motors Truck Co	Pontiac, Mich	General Motors Truck Co	Boston, Mass.
13	Gramm-Bernstein	Gramm-Bernstein Co	Lima, Ohio	R. E. Taylor Corp	Cambridge, Mass.
14	G. V	General Vehicle Co	Long Island City, N. Y	General Vehicle Co., Inc	Boston, Mass.
15	Hurlburt	Hurlburt Motor Truck Co	New York City	Day Baker Motor Truck Co	Boston, Mass.
16	I. H. C	International Harvester Corp	Akron, Ohio	International Harvester Co	Somerville, Mass.
17	Indiana	Indiana Truck Corp	Marion, Ind	Indiana Truck Corp	Marion, Ind.
18	Jeffery	Nash Motors Co	Kenosha, Wis	C. P. Rockwell, Inc	Boston, Mass.
19	Kelly-Springfield	Kelly-Springfield Motor Truck Co	Springfield, Ohio	Kelly-Springfield Motor Truck Co	Boston, Mass.
20	Kisselkar	Kissel Motor Car Co	Hartford, Wis	Kisselkar New England Branch	Boston, Mass.
21	Krebs	Krebs Commercial Car Co	Clyde, Ohio		
22	Mack	International Motor Co	New York City	Mack Motor Truck Co	Boston, Mass.
23	Mackbilt	Metropolitan Motors, Inc	New York City	Metropolitan Motors, Inc	New York City
24	Maxwell	Maxwell Motor Co	Detroit	Maxwell Motor Sales Corp	Boston, Mass.
25	Menominee	Menominee Motor Truck Co	Menominee, Mich	Victor Motor Car Co	Boston, Mass.
26	Mets	Mets Co	Waltham, Mass	Mets Co	Waltham, Mass.
27	Netco	New England Truck Co	Fitchburg, Mass	New England Truck Co	Fitchburg, Mass.
28	Overland	Willys-Overland Co	Toledo, Ohio	Connell & McKone Co	Boston, Mass.
29	Packard	Packard Motor Car Co	Detroit	Packard Motor Car Co. of Boston	Boston, Mass.
30	Pierce-Arrow	Pierce-Arrow Motor Car Co	Buffalo, N. Y	J. W. Maguire Co	Boston, Mass.
31	Reo	Reo Motor Car Co	Lansing, Mich	Linscott Motor Co	Boston, Mass.
32	Riker	Locomobile Co	Bridgeport, Conn	Locomobile Co	Boston, Mass.
33	Selden	Selden Motor Vehicle Co	Rochester, N. Y	Baker Motor Sales Co	Cambridge, Mass.
34	Signal	Signal Motor Truck Co	Detroit	Signal Motor Truck Co. of N. E	Boston, Mass.
35	Stewart	Stewart Motor Corp	Buffalo, N. Y	H. Ross Maddocks Co	Boston, Mass.
36	Studebaker	Studebaker Corp	Detroit	Studebaker Corp	Boston, Mass.
37	Transport Tractor	Transport Tractor Co	Long Island, City N. Y	Transport Tractor Co	Long Island City, N. Y.
38	Vim	Vim Motor Truck Co	Philadelphia, Pa	Vim Motor Truck Co	Philadelphia, Pa.
39	White	White Co	Cleveland, Ohio	White Co	Boston, Mass.

FORD ADAPTERS

Hudford	Hudford Co	Philadelphia, Pa	Hudford Boston Co	Boston, Mass.
Longford	Motor Accessory Distributing Co	Boston, Mass	Longford Co	Cambridge, Mass.
Smith	Smith Form-A Truck Co	Chicago	Smith Form-A Truck Co	Boston, Mass.

†To be shown at the Copley Square Hotel, Boston, Mass.

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The Brooklyn Show

The Only Exclusive Motor Truck Show in the United States Offers More Than 100 Chassis of Thirty-two Makes on the Altar of Haulage Efficiency—A Vehicle for Almost Every Purpose May Be Selected From Among Those Present

THE only exclusive motor truck show to be held anywhere in the United States during the 1917 season, the Brooklyn, N. Y., commercial vehicle exhibition to be held at the Twenty-third Regiment Armory in that city from March 6 to 10, now takes on a real metropolitan aspect. It will be the only exclusive or combined passenger car and motor truck show to be held in the metropolitan district of Greater New York nearer the city than Philadelphia, Pa., on the southwest, Albany, N. Y., on the north, and Hartford, Conn., on the northeast.

No Trucks at Newark

The combined passenger car and motor truck show which was to be held in Newark, N. J., less than 10 miles from New York City, was first postponed from February 17-24 to February 24-March 3, and then transferred from one location to another, the latter too small to admit any truck models at all. It was originally planned to hold the exhibition in the armory of the First Regiment of New Jersey, but the Federal inspection of the regiment caused by the present strained relations between this country and Germany, made it impossible to hold the show at the same time.

Foreign Relations Forced Postponement

It was then postponed a week but the acuteness of our relations with Germany finally forced the government to withdraw the privilege of the use of the armory as a measure of preparedness in case of international complications.

The exhibition was then transferred to the Palace Ball Room in Newark, where it was originally proposed to show seventeen makes of commercial vehicles and fifty-eight makes of passenger cars. In the scramble for the lesser space in the new location, however, the truck exhibits were frozen out altogether, thus leaving Brooklyn in undisputed possession of the motor truck field insofar as this year's exhibitions are concerned.

The Brooklyn show may lay claim to another distinction, that of being the first exclusive motor truck exhibition held anywhere in the metropolitan district since 1912, when the national commercial vehicle shows held in New York City and Chicago were discontinued.

Almost as Large as Boston Show

The Metropolitan aspect of this year's Brooklyn show may be gauged better perhaps by considering that no less than 101 vehicles of thirty-two or more different makes will be exhibited in addition to seven makes of adapters for Fords and other passenger cars, commercial bodies for Ford cars and the usual run of truck bodies and accessories particularly adapted for motor truck use.

Unless serious changes are made in the exhibits to be shown at the Brooklyn and Boston, Mass., shows, as given respectively on the opposite page and on page 17, the Brooklyn show will be very nearly as large as that in Boston. This is indeed remarkable when it is considered that Boston has held her combined passenger car and motor truck show every year since 1914, while the first real showing of motor trucks in the Metropolitan district following the discontinuance of the national truck shows was the Brooklyn show of last year.

This year's show pigmies last year's by comparison for only seven makes, comprising twenty vehicles in all, were put on the counter in 1916 for the critical Gotham truck buyer to choose from. This year's showing is thus almost five times as large as last year's, both in the number of makes and the number of vehicles exhibited.

Demands Made Separate Show Necessary

Brooklyn, which since 1912 has each year harbored the only commercial vehicle exhibition in Greater New York, has thus gone a step further this year by staging an exclusive truck show. It was not the intention to have a separate truck show at first, but the demands for truck exhibition space were so much in excess of the available space without crowding out some of the passenger cars that the Brooklyn Motor Vehicle Dealers' Association was forced to consider either two shows in separate buildings or separate shows in the same building at different times.

The latter course was finally decided upon as being the most economical and the truck show will accordingly be held the week following the passenger car exhibition in the same building. The latter show closes on Saturday, March 3, and the Sunday and Monday intervening between then and the following Tuesday will be employed for removing all the passenger cars from the armory floor and installing the trucks in their places.

It is unfortunate that it is not possible to hold both of the shows simultaneously, but evidently the expense of hiring and decorating two halls with all the necessary incidentals of two separate show staffs and officers is too heavy for the association in charge of the exhibitions to consider.

Two Separate Shows

The fact that the sales staffs of dealers handling both passenger cars and trucks will have to spend 2 weeks running at the shows is not so serious as it might seem in view of the fact that all except one of the thirty-two makes of trucks to be shown will be placed on exhibition by manufacturers, branches or agents either in New York City or Brooklyn or by factories located in the Metropolitan area.

New York Exhibitors Predominate

It is interesting to note from the list of exhibitors shown on the opposite page that nineteen out of the thirty-two are located in New York City, twelve in Brooklyn and one direct factory showing from a manufacturer located in upper New York State. This would seem to indicate that New York City dealers have taken advantage of their opportunity to exhibit their wares across the East River in the city of church spires and baby carriages when the national show held in Gotham early in January prohibited even desk room for truck makers as was the case in 1916.

The fact that so many of the New York City dealers demanded space in the Brooklyn show would seem to indicate

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that they are heartily in favor of a resumption of motor truck shows of some sort.

A canvass of dealers in the Metropolitan district would seem to indicate otherwise, paradoxical as it may appear. Many Gotham truck agents who maintain no branches or salesrooms in Brooklyn are exhibiting merely for the publicity such showings will give without expecting any direct sales from the show. In several cases it was evident that a dealer or agent exhibited simply because one of his competitors, perhaps with a new truck or one handling a vehicle not previously well known in the territory had contracted for space.

Value of Show Undefined

While there appears to be a great divergence of opinion among the metropolitan dealers as to the actual value to be derived from the Brooklyn show, the fact that so many have agreed to come in is indicative of the general feeling that some kind of commercial vehicle show should be held in New York City each year. It is somewhat difficult to discover just what form such a show should take, but the fact that the Motor Truck Club of America, a users' organization almost exclusively, is seriously considering staging a truck show at some future date is proof that some sort of a show would be beneficial.

Perhaps next year's metropolitan truck exhibition will take the form of a Transportation Convention such as outlined in the editorial on pages 10 and 11 of this issue. A convention of that sort with the get-together spirit it would instill by a discussion of the latest in modern vehicular transportation and a simultaneous showing of the vehicles themselves could be made to have a direct appeal to a large number of industries in which motor trucks are performing an indispensible service even now.

From the large number of trucks to be exhibited at this year's Brooklyn show, the metropolitan purchaser will find one or more vehicles to exactly meet his operating conditions, no matter whether he be a manufacturer, a wholesaler or a retailer. From the 800-lb. Overland delivery vehicle up to the 7-ton Hurlburt, there are many intermediate sizes with different forms of final drive, different frame constructions, different powerplant assemblies and different radiator types. With the large variety offered, the prospective purchaser who has leanings toward this or that particular type of construction will be sure to have a choice between several makes of vehicles, each of which will incorporate the construction which to his mind is best.

Besides the various models of any particular tonnage required, the buyer will also have considerable choice in prices as these range from what is considered low to what may be thought to be high if the quality of the product is not carefully taken into consideration.

Trucks which were shown last year include the Hall, G. A. Schacht, Garford, White, Pierce-Arrow, Studebaker and Buick. Of these the Hall, Garford, White, Pierce-Arrow and Studebaker will be among those exhibited again this year. The G. A. Schacht will be missing. Buick delivery models were discontinued during 1916 so that they, too, will be among those missing.

Reo Has Largest Exhibit

The largest exhibit in point of numbers according to the data available at this writing will be that of Reo trucks of which twelve vehicles will be shown. These will include both chassis and complete jobs with various types of bodies. The capacities of the vehicles will be 1500-lb. and 2-tons, the only sizes made by the Reo company.

Next in line in point of numbers will be the Gramm-Bernstein and Studebaker, the former exhibited for the first time by the R. E. Taylor Corp., which until last month handled the Garford line in the East. Five vehicles of both the Gramm-Bernstein and Studebaker makes, the latter of ½- and 1-ton capacities, will be shown.

The Brooklyn, N. Y., Truck Show

101 Trucks of Thirty-two Makes will be Shown—Who they will Be Exhibited by

	Truck	No. to be Shown	Maker	Maker's Address	Exhibitor	Exhibitor's Address
1	Armleder	3	O. Armleder Co	Cincinnati, Ohio	Broadway Motor Truck Co	New York City
2	D-E	3	Day-Elder Motors Co	Newark, N. J	Colonial Auto Truck Co	Brooklyn, N. Y.
3	Dodge Bros	3	Dodge Bros	Detroit, Mich	Bishop, McCormick & Bishop	Brooklyn, N. Y.
4	Federal	3	Federal Motor Truck Co	Detroit, Mich	M. W. Smith Co	New York City
5	Fulton	2	Fulton Motor Truck Co	Farmingdale, L. I. N. Y.	Lawrence Motor Sales Co	New York City
6	Garford	1	Garford Motor Truck Co	Lima, Ohio	Garford Motor Truck Co., Inc	New York City
7	G. M. C.	5	General Motors Truck Co	Pontiac, Mich	General Motors Truck Co	New York City
8	Gramm-Bernstein	3	Gramm-Bernstein Co	Lima, Ohio	R. E. Taylor Corp	New York City
9	Hall	1	Lewis-Hall Iron Wks	Detroit Mich	H.A. Edward Sales & Service Co., Inc.	Brooklyn, N. Y.
10	Hurlburt	2	Hurlburt Motor Truck Co	New York City	Hurlburt Motor Truck Co	New York City
11	Inter-State	1	Inter-State Motor Co	Muncie, Ind	Garland Auto Co	New York City
12	Larrabee	1	Larrabee-Deyo Motor Truck Co	Binghamton, N. Y	Larrabee-Deyo Motor Truck Co	Binghamton, N. Y.
13	Maccar	4	Maccar Co	Scranton, Pa	Pitts Motor Truck Co	Brooklyn, N. Y.
14	Mack	2	International Motor Co	New York City	International Motor Co	New York City
15	Overland	2	Willys-Overland Co	Toledo ,Ohio	Willys-Overland Co	Brooklyn, N. Y.
16	Packard	3	Packard Motor Car Co	Detroit, Mich	Packard Motor Car Co	Brooklyn, N. Y.
17	Pierce-Arrow	4	Pierce-Arrow Motor Car Co	Buffalo, N. Y	H. L. Carpenter	Brooklyn, N. Y.
18	Pullman	3	Pullman Motor Car Co	York, Pa	J. R. Ready	Brooklyn, N. Y.
19	Rainier	3	Rainier Motor Corp	New York City	Rainier Motor Corp	New York City
20	Reo	12	Reo Motor Car Co	Lansing, Mich	Reo Motor Car Co. of N. Y	Brooklyn, N. Y.
21	Republic	6	Republic Motor Truck Co	Alma, Mich	Republic Motor Sales Co	New York City
22	Riker	2	Locomobile Co	Bridgeport, Conn	W. H. Konwenhoven	New York City
23	Selden	2	Selden Motor Vehicle Co	Rochester, N. Y	Manhattan Motors Corp	New York City
24	Signal	2	Signal Motor Truck Co	Detroit, Mich	Curth Auto Truck Co	Brooklyn, N. Y.
25	Sterling	3	Sterling Motor Truck Co	Milwaukee, Wis	Sterling Motor Truck Co. of N. Y	New York City
26	Stewart	4	Stewart Motor Corp	Buffalo, N. Y	Lincoln Motor Co	New York City
27	Studebaker	5	Studebaker Corp	Detroit, Mich	Studebaker Corp	Brooklyn, N. Y.
28	Sullivan	2	Sullivan Motor Car Co	Rochester, N. Y	Broadway Motor Truck Co	New York City
29	U. S.	2	United States Motor Truck Co	Covington, Ky	Economy Motor Truck Co	Brooklyn, N. Y.
30	Velie	2	Velie Motor Vehicle Co	Moline, Ill	Garland Auto Co	New York City,
31	Vim	5	Vim Motor Truck Co	Philadelphia, Pa	Manhattan Motors Corp	New York City
32	White	5	White Co	Cleveland, Ohio	White Co	New York City
		101				
			FORD ADAPTERS			
	Camelford	1	Maremont Mfg. Co	Chicago	Popular Motor Car Distributors	New York City
	Dearborn	..	Dearborn Motor Truck Co	Chicago	Dearborn Truck Sales Co	New York City
	H-D	6	Hayes-Diefenderfer Co	New York City	A. R. Tator	Brooklyn, N. Y.
	Redden	..	Redden Motor Truck Co	New York City	C. F. Redden	New York City
	Smith	1	Smith Form-A Truck Co	Chicago	Bishop, McCormick & Bishop	Brooklyn, N. Y.
	Tonford	1	Detroit Truck Co	Detroit	Curth Auto Sales Co	Brooklyn, N. Y.
	Willholl	1	Wilson-Holland Mfg. Co	Detroit	Popular Motor Car Distributors	New York City
			FORD DELIVERY CARS			
	Ford	2	Ford Motor Co	Detroit	Ford Delivery Car Co., Inc	New York City
	Ford	1	Ford Motor Co	Detroit	Popular Motor Car Distributors	New York City
			BODIES			
	Roeder	..	Roeder Commercial Body Co	Brooklyn, N. Y	Roeder Commercial Body Co	Brooklyn, N Y.

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Electric Trucks Must Have Universally Interchangeable Batteries

To Attain Popularity, Says Sales Veteran

By Day Baker

STANDARDIZATION of batteries and compartments on electric commercial vehicles is urged by Mr. Baker in the discussion below. Mr. Baker has a long record as a successful dealer and sales manager in the electric truck field. The development of interchangeable battery service systems has been rapid in the past few years and it is now recognized as the ultimate solution of the greatest remaining electric truck problem, for by purchasing electrics without batteries purchasers are able to secure them at approximately the same cost as gasoline trucks, the heavy investment represented by the battery being carried by the central station, users merely renting the service of the batteries at so much per day, per charge or per mile. Mr. Baker states that Thomas A. Edison has given his approval of this advanced idea.

EVERYONE interested in the manufacture and sale of commercial electric vehicles will agree that the state of the industry has reached a point where it seems impossible to make the curve of production show an upward formation.

The electric truck is fundamentally right. This is acknowledged and demonstrated by many of the largest users of transportation in this country and abroad. The electric truck, the electric way of doing transportation, appeals to the average mechanically-inclined business man. Then why is the electric truck not more popular and more universally accepted?

1—The great dearth of educational advertising of the electric truck as an economic conveyor of merchandise, as compared with the volume of advertising of other forms of trucks. The electric truck needs intelligent advertising; yes, volumes of intelligent advertising.

2—The Battery: the traditions of the earlier storage batteries, the limitations of mileage from one charge, the time required to recharge storage batteries and the uncertainty of battery cost and maintenance have combined to impress on the users of transportation a feeling of contempt for the electric truck.

Therefore, aside from the rather indifferent method of merchandising electric trucks, it may be said that the cause for the stagnation in the advance of the electric truck business is due to the electric storage battery, or perhaps to the reputation of the older forms of batteries which have been handed down, and the limitations as to mileage and charging.

The weak point of the electric truck for commercial use is undeniably the limitations of the battery, and, therefore, I believe that the National Electric Light Assn., through the Electric Vehicle Section, should come to the rescue of the electric truck by providing a method of overcoming the obstacles which stand in the way of its more general adoption.

As has been shown by one of the large central stations, a system of battery exchange will greatly popularize the battery truck, if it is possible to have battery compartments of a standard size for each capacity of vehicle.

*Presented to the Electric Vehicle Section, National Electric Light Assn., New York City, January 25, 1917.

The experiments which have been made with the battery exchange system have shown that the general principles underlying this idea are right and represent an excellent method of handling electric commercial vehicles, but in order to build up the vehicle industry as a whole, and that is the only way for the National Electric Light Assn. to treat the subject, it must not be handled on any but the broadest lines and in a manner which will place the electric truck and a national battery exchange system beyond the criticism of the public, and on a sound legal basis, conforming to the requirements of the public service commissions of the various States. A system on the indicated lines would present the electric truck in such an attractive manner to the public that it would draw, yes, actually command the hearty support of all truck and battery manufacturers, as well as the central stations. Such a bond welded in the interest of *all* the manufacturers would do more for the electric truck industry throughout the world than volumes of silvery-worded excuses apologizing for the enforced limitations of the systems which have been devised.

I feel that the discussion of the present forms of battery service systems, and the attempt to capture the commercial vehicle field has disrupted the former cordial relations existing between the various vehicle and battery manufacturers and their selling organizations.

It can be readily seen that with such a universal battery exchange system as I am suggesting, the makers of batteries would have a feeling of security in ordering materials and in building in advance of actual orders good stocks of crates, ordering large numbers of jars and even assembling batteries for the various sizes, knowing that they could be used in *any* make of vehicle.

At the present time there are four methods available for the quick exchange of batteries in electric trucks.

1—That designed by the Electric Vehicle Co. of Hartford, Conn., which is used by the Edison Co., and the R. H. Macy Co. of New York, and the Amoskeag Mfg. Co., Manchester, N. H., with a few other scattering installations.

2—The device invented by Mr. R. McAllister Lloyd.

3—The device invented by Mr. M. I. Stone of the W. P. Stone Co. of Boston, and used on a number of makes of trucks in that city.

4—The roll-in or slide-in battery device, which is used on quite a number of Couple-Gear trucks in Boston, and I believe has been developed for use of a battery exchange service in Chicago.

The first two devices require for their proper operation the use of one or more hydraulic lifts, and are so constructed that it is not practical to truss the frames, as is often found desirable, especially if the weight of the frames is to be kept within desired limits.

With the last two devices no hydraulic lift or other expensive loading machine is required.

The third device is extremely simple, admits of application to any make of truck, trussing of the frames and does not necessitate the purchase of extra cradles at an expense of over $100.00 each for the additional batteries.

I am not an advocate of any especial form of carrier for holding the batteries, believing that if this matter is handled by the committee on standards they will adopt one which will embody the greatest simplicity, without weakening the chassis design.

Manufacturing rights can no doubt be obtained for any of the patented devices, at a price per vehicle, which would add only a very small percentage to the manufacturing cost of each truck.

The desirable system of exchange of batteries carries with it the possibilities of presenting to the vehicle-purchasing public a real innovation of value and interest, without any strings to retard its legal adoption or popularity, which, coupled with the possibilities of presenting electricity by the mile, opens the way for a co-operative advertising campaign by the N. E. L. A. members, and the vehicle and battery manufacturers which could not fail of results.

With the consolidation of the Electric Vehicle Assn. as a section of the N. E. L. A., and the truck manufacturers asking for the latter's support, the latter association now has it in its power, as the real arbiter of the destiny of the electric truck, to establish battery compartment standards. These must admit of the interchangeable use of any make of battery which is constructed on lines and with characteristics approved by the N. E. L. A. in any of the accepted forms of storage battery road trucks.

With standardized battery cradles it would be practical, should any central station desire, to sell electric current by the mile, a method already demonstrated with some success in Hartford and Boston. This method of vending current would be sure to become popular, as it converts k.w.-hr. into terms which all vehicle users readily understand. It would give the world the possibilities of real battery exchange systems, make the electric truck popular, bring orders to all the manufacturers of trucks and batteries, unite the electric vehicle industry and conserve the benefits of the valuable off-peak load, which is sure to result from the proper merchandising of electric trucks and electric current.

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Men of the Industry Who Will Be at the Shows

Representatives of Truck Makers and Parts and Accessory Concerns Listed Alphabetically for Convenience of Prospective Buyers and Others

Arranged for the convenience of prospective buyers and others at either the Boston, Mass., or Brooklyn, N. Y., motor truck shows, THE COMMERCIAL VEHICLE *herewith publishes lists of the various representatives who will be present at both shows and at what hotels they are registered or where they can be reached. The truck representatives are listed separately in each case under the heading of the name of the truck made by their respective companies. These are arranged in alphabetical order for greater convenience. Similar lists for representatives of the parts and accessory concerns are given for each show.*

TRUCK REPRESENTATIVES

Atlantic electric,
Represented by
Day Baker Motor Truck Co.,
110 State Street, Boston, Mass.

Atlas,
Martin Truck & Body Corp., York, Pa.
Represented by
G. W. Hall, Mgr. Sales,
Adams House.

Autocar,
Represented by
D. S. Ludlum, Pres.,
H. M. Coale, Sales Mgr.,
Autocar Branch.

Brockway,
Brockway Motor Truck Co.,
Cortland, N. Y.
Represented by
W. M. Denman, N. E. Sales Mgr.,
W. D. Morse, General Sales Mgr.,
Brunswick Hotel.

Chase,
Chase Motor Truck Co.,
Syracuse, N. Y.
Represented by
E. A. Dauer,
At Show.

Commerce,
Represented by
G. D. Wilcox, Sales Mgr.,
W. H. Brinkerhoff, Eastern Dist. Mgr.,
Copley Square Hotel.

C. T. electric,
Represented by
Lewis-Shepard Co.,
272 Dover Street.

D-E,
Day-Elder Motor Corp.,
Newark, N. J.
Represented by
P. K. Hexter, General Sales Mgr.,
H. G. Reid, Eastern Sales Mgr.,
Copley-Plaza Hotel.

Denmo,
Denneen Motor Co.,
Cleveland, Ohio.
Represented by
E. W. Corman, Sales Mgr.,
Hotel Touraine.

Duplex,
Represented by
C. O. Canniff,
Copley-Plaza Hotel.

Fulton,
Fulton Motor Truck Co.,
Farmingdale, L. I., N. Y.
Represented by
G. C. Bensinger,
Adams House.

G. M. C.,
Represented by
J. E. Baird,
At Show.

G. V.,
Represented by
G. H. Hudson, District Mgr.,
590 Commonwealth Avenue,
and Copley-Plaza Hotel.

Hurlburt,
Represented by
W. B. Hurlburt,
Mr. Wells,
P. W. Walker,
Copley-Plaza Hotel.

I. H. C.,
International Harvester Co.,
Akron, Ohio.
Represented by
O. H. Browning, Truck Sales Mgr.,
R. H. Nesbitt, Boston Branch Mgr.,
43 Sommerville Avenue.
Boston, Mass.

Indiana,
Indiana Truck Corp.,
Marion, Ind.
Represented by
C. G. Barley,
R. D. Campbell,
At Show.

Kelly-Springfield,
Represented by
F. B. Hutchinson, Sales Mgr.,
L. P. Kalb, Eng.,
Copley-Plaza Hotel.

Mackbilt,
Metropolitan Motors, Inc.
Represented by
W. C. Mack, Pres.;
L. F. Bond, Treas.;
J. C. Marley, Secty.,
Hotel Lenox.

Selden,
Represented by
J. E. Morse, N. E. Dist. Sales Mgr.,
C. E. Collard, East. Dist. Sales Mgr.,
H. T. Boulden, Sales Director,
Copley-Plaza Hotel.

Studebaker,
Studebaker Corp., Detroit.
Represented by
H. T. Myers, Sales Mgr.,
L. J. Ollier, Vice-pres.,
G. N. Jordan, Branch Mgr.,
Copley-Plaza Hotel.

Thomas,
Thomas Auto Truck Co.,
New York City.
Represented by
M. D. Herron,
Touraine Hotel.

U. S.
Represented by
F. J. Alvin, Genrl. Sales Mgr.,
At THE COMMERCIAL VEHICLE
Headquarters,
Copley-Plaza Hotel.

Velie,
Velie Motors Corp.,
Moline, Ill.
Represented by
J. E. Bradfield, Sales Mgr.,
H. T. Wheelock, Advt. Mgr.,
Copley-Plaza Hotel.

Vim,
Vim Motor Truck Co.,
Philadelphia, Pa.
Represented by
W. G. Smith,
Adams House.

White,
White Co.,
Cleveland, Ohio.
Represented by
J. S. Hathaway, Mgr.,
930 Commonwealth Avenue.

Wilson,
J. C. Wilson Co.,
Detroit.
Represented by
H. J. Flint, Genrl. Sales Mgr.,
C. E. Stone, Advt. Director,
Copley-Plaza Hotel.

Winther,
Winther Motor Truck Co.,
Kenosha, Wis.
Represented by
W. D. Rightmire,
Copley-Plaza Hotel.

Wisconsin,
Myers Machine Co.,
Sheboygan, Wis.
Represented by
G. P. Myers,
Copley-Plaza Hotel,

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PARTS AND ACCESSORY REPRESENTATIVES

Ahlberg Bearing Co.,
Chicago.
Represented by
F. O. Burkholder, Mgr.,
93 Massachusetts avenue.

American Bronze Co.,
Berwyn, Pa.
Represented by
Motor Parts Co.,
185 Columbus Avenue.

American Taximeter Co.,
New York City.
Represented by
W. E. McGuirk,
Copley-Plaza Hotel,
Eben Luther,
68 Brookline Avenue.

Batavia Rubber Co.,
Batavia, N. Y.
Represented by
W. P. Berrien, Sales Mgr.,
Copley-Plaza Hotel.

Bound Brook Oil-less Bearing Co.,
Bound Brook, N. J.
Represented by
C. O. Smalley, General Mgr.,
W. F. Jennings, Eastern Sales Mgr.,
Touraine Hotel.

Baush Machine Tool Co.,
Springfield, Mass.
Represented by
H. A. Daniels,
Hotel Thorndike.

Clark Equipment Co.,
Buchanan, Mich.
Represented by
E. B. Ross,
J. P. Ware,
Hotel Touraine,

Columbia Wagon Co.,
Columbia, Pa.
Represented by
V. D. Ten Broeck,
At Quincy House.

Crew Levick Co.,
Philadelphia, Pa.
Represented by
Decatur & Hopkins Co.,
Boston Mass., and
N. W. McGrew,
E. E. Grignard,
W. E. Washburn,
Technology Chambers,
8 Irvington street.

Duplex Engine Governor Co.,
Brooklyn, N. Y.
Represented by
J. E. Simonds,
Copley-Plaza Hotel.

Edmunds & Jones Corp.,
Detroit.
Represented by
W. J. Connell Co.,
171 Massachusetts Avenue.

Fafnir Bearing Co.,
New Britain, Conn.
Represented by
J. V. Wilson Co.,
191 Massachusetts Avenue.

Findeisen & Kropf Mfg. Co.,
Chicago.
Rayfield Carbureter,
Represented by
Lester Perrine,
A. E. Barlow,
Copley Square Hotel.

General Lead Batteries Co.,
Newark, N. J.
Represented by
A. D. Stevenson,
Hotel Lenox.

Gray & Davis,
Cambridge, Mass.
At Factory,
Charles River Road.

Guaranty Securities Corp.,
New York City.
Represented by
R. F. Brown,
Copley-Plaza Hotel.

George Haiss Mfg. Co.,
New York City,
Represented by
Dyar Supply Co.,
66 Broadway, Cambridge, Mass.

Hood Tire Co.,
Represented by
C. M. Evans,
At Factory,
Watertown, Mass.

Indian Refining Co.,
New York City,
Represented by
L. L. Hoyues,
Indian Refining Co.

Master Carbureter Corp.,
Detroit.
Represented by
W. B. Tepoorten,
181 Massachusetts Avenue.

Mohawk Rubber Co.,
Akron, Ohio.
Represented by
N. W. Biggart, Dist. Mgr.,
86 Brookline Avenue.

A. R. Mosler & Co.,
Mt. Vernon, N. Y.
Represented by
J. W. Fischer, Jr.,
Hotel Touraine.

New Era Spring & Specialty Co.,
Detroit.
Represented by
S. Daniels, Pres.,
Hotel Thorndike.

Ross Gear & Tool Co.,
Lafayette, Ind.
Represented by
E. A. Ross,
106 Strathmore Road,
Coolidge Corners, Mass.;
H. A. Dick,
Copley-Plaza Hotel.

Russel Motor Axle Co.,
North Detroit, Mich.,
Represented by
G. B. Russel,
H. S. Graves,
Copley-Plaza Hotel.

Smith Wheel, Inc.,
Syracuse, N. Y.
Represented by
J. C. Neville,
Copley-Plaza Hotel.

Torbensen Axle Co.,
Cleveland, Ohio.
Represented by
R. C. Enos, Sales Mgr.,
W. F. Rockwell, Asst. Gen. Mgr.,
Copley-Plaza Hotel.

Troy Wagon Works Co.,
Troy, Ohio.
Represented by
Duplex Truck Co.,
708 Beacon Street.

U. S. Ball Bearing Co.,
Chicago.
Represented by
H. L. Spohn,
Copley-Plaza Hotel.

U. S. Light & Heat Corp.,
Niagara Falls, N. Y.
Represented by
J. A. White, Sales Mgr.,
Harvard Club;
W. W. Halsey, Mgr. N. Y. Office;
L. R. Sutherland,
United States Hotel.

Vacuum Oil Co.,
New York City.
Represented by
E. E. Wadsworth,
49 Federal Street.

Waukesha Motor Co.,
Waukesha, Wis.
Represented by
H. L. Horning,
Hotel Lenox.

Young Patent Hoist Co.,
Milwaukee, Wis.
Represented by
E. R. Bacon,
Touraine Hotel.

Representatives Who Will Attend Brooklyn's Motor Truck Show

TRUCK REPRESENTATIVES

Brockway,
Represented by
J. A. Innes, N. Y. Branch Mgr.

Chase,
Chase Motor Truck Co.,
Syracuse, N. Y.
Represented by
B. E. Blackley,
102 West Twenty-fourth street,
New York City.

Commerce,
Represented by
W. H. Brinkerhoff, Dist. Mgr.,
12 Belmont Avenue,
Elmhurst, L. I.

C. T. Electric,
Represented by
J. S. Woods, Mgr.,

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Metropolitan District—Greatest Truck Center, Still Only Partially Developed

Great Density of Population, Extensive Dependent Territory and Keenest Competition Demand More Commercial Vehicles

GREATER New York, the most highly developed motor truck center in the world, is as yet only partially developed. Its great density of population, its wide dependent territory, its many manufacturing establishments located within one day's run from the heart of the city, and the keen competition between its manufacturers, distributers and retailers, all demand an increasing number of commercial vehicles.

The point of absorption of motor trucks in the metropolitan territory is not yet in sight. In fact, it is doubtful if such a point will ever be reached. For as the city expands its need for the most modern transportation means will increase in a much greater ratio because of the larger territory which must be served.

New York City's commercial vehicles have increased approximately 66 per cent during the past year. She now has more than 14,000 trucks registered within her limits, not to mention several thousand more which daily enter the metropolitan district from the thickly populated territory across the Hudson River in New Jersey and others from the lower half of Connecticut.

Magnitude of Metropolitan Motorization

As a means of comparing Gotham's motor trucks with the numbers in use in other sections of the country it is interesting to note that there are almost as many trucks registered in the city of New York as there are in the entire State of Massachusetts. Between 38 and 40 per cent of the 34,653 commercial vehicles registered in the State of New York up to Feb. 1 are used in the metropolitan area of the Greater City. It is also interesting to note that the 34,000-odd trucks now in use in the Empire State are greater in number than the motor trucks in all of Great Britain before the beginning of the present war.

Delivery Problem Increasingly Difficult

New York's great density of population may be realized when it is considered that there are more than 9,000,000 inhabitants located within a 50 mile radius of the metropolis. A great majority of this tremendous population is dependent to some extent upon the city itself for its necessities of life and for its business communication with the rest of the country. Of this 9 or 10 million population approximately 5 million are located within the confines of the Greater City itself. All these people must be served with their food, clothing, coal, ice, wood and the other necessities for existence. Due to the tendency of the city to expand and cover more territory, the lengths of haul required to deliver these necessities are becoming greater and greater each year and further and further beyond the limitations of the horse-drawn vehicle.

Aside from the inability of animals to serve this great territory due to their own physical limitations the population itself is demanding better and quicker service each year. Department store patrons are demanding that their purchases be delivered daily within a 40-mile radius and that such deliveries be made the day following the purchase. The people must have quick service and since motor trucks are the only means of providing such deliveries, it is practically assured that there always will be a large demand for them so long as the city continues to grow.

The territory on the outskirts of the city proper is literally honeycombed with both large and small manufacturing plants, which have purposely located there because of the comparatively low cost of the land and the ability to extend and enlarge their plants as the occasion demands. Most of such manufacturing concerns deliver a considerable proportion of their products within the Metropolitan area. While 2 or 3 years ago much of this work was done by railroad, the freight embargo occasioned by the great reduction of shipping bottoms has made it practically impossible to continue it unless the time element is inconsequential. For this reason the greater proportion of the shipments between these outlying manufacturing plants and the city itself are now transferred by motor trucks.

This character of work has grown to considerable proportions during the last

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Representatives Who Will Attend Brooklyn's Motor Truck Show

(*Continued from page* 22.)

30 East Forty-second Street,
New York City.

D-E,
Represented by
W. C. Edwards,
Brooklyn, N. Y.

G. M. C.
Represented by
J. E. Baird, At Show.

Hurlburt,
Represented by
P. W. Walker,
Factory, 133d Street
New York City.

Knickerbocker,
Knickerbocker Motors, Inc.,
New York City.
Represented by
A. C. Brady,
H. H. Ganz.

Larrabee,
Larrabee-Deyo Motor Truck Co.,
Binghamton, N. Y.
Represented by
P. S. Leahy,
81 Columbia Heights,
Brooklyn, N. Y.;
F. S. Macey,
Martinique Hotel, New York City.

Maccar,
Represented by
Pitts Motor Car Repair & Sales Corp.,
Brooklyn, N. Y.

Selden,
Represented by
H. T. Boulden, Sales Director,
H. D. Chapin,
Manhattan Motors Corp.,
New York City.

Thomas,
Represented by
M. D. Herron, Sales Mgr.,
639 West Fifty-first Street,
New York City.

Velie,
Velie Motors Corp.,
Moline, Ill.
Represented by
Thomas Martin, Dist. Rep.,
E. L. Flanigan, Dist. Rep.,
Claridge Hotel, New York City.

White,
Represented by
R. H. Johnston, Mgr.,
White Branch,
Broadway, at Sixty-second Street,
New York City.

Wilson,
J. C. Wilson Co.,
Detroit.
Represented by
Cole & Dixon, Inc.,
228 West Fifty-eighth street,
New York City.

Wisconsin,
Myers Machine Co.,
Sheboygan, Wis.

(*Continued on page* 24.)

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Metropolitan District—Greatest Truck Center Still Only Partially Developed

(*Continued from page* 23.)

2 years. Many concerns engaged in munitions work, such as E. W. Bliss Co., Brooklyn, N. Y., were threatened with the loss of their contracts due to the inability of getting their material and turned to motor trucks as the only means of their salvation.

Since the recent acute relations with Germany one large soap manufacturing concern located on the Hackensack River, within 5 miles of New York and 5 miles of Newark, N. J., has found it necessary to employ its trucks to haul all of its incoming goods. Due to the great tie-up of freight cars at the port of New York, this concern often has to wait a week or 10 days to have a freight car transferred 5 miles from Newark to its plant. These exceptionally poor conditions have been overcome by the use of trucks for hauling goods and raw products between the Newark freight houses and the company's plant.

Overland haulage has also increased to a considerable extent in the Metropolitan territory during the last year. The great possibilities for the motor truck in the inter-city haulage of freight was suddenly crystallized in October, 1916, by a threatened country-wide railroad strike. If the railroad's facilities had been only partially paralyzed motor trucks would have been the most available means of transporting the vitally needed food products between the farms on the outskirts of the Metropolitan area and for the haulage of all classes of goods into and out of the city proper.

One particularly good example of this class of work was handled by the Heavy Haulage Co. of New York City. Due to the freight embargo in existence at the time when the New York, New Haven & Hartford Railroad, the S. K. F. Ball Bearing Co., Hartford, Conn., was unable to secure freight cars for shipment of 40 tons of material to open its new plant in that city. The Heavy Haulage Co. contracted to haul the material to the Hartford plant for the sum of $900, or at the rate of $22.50 a ton. By rail the cost would have been approximately $100, yet the ball bearing concern considered the additional $800 well spent when it was considered what its loss would have been if the overhead on the plant, due to the inability to start production and loss of prestige to make its deliveries on time.

Need For Two-Way Hauls

While it is a fact that there is great opportunity for the further development of inter-city haulage in the Metropolitan territory, one of the greatest drawbacks which must be overcome is the inability to obtain loads for both directions. This can only be done by a thorough study of the territory to be covered and the discovery of plants at both ends of the route from which goods may be transported in either direction. The Heavy Haulage Co. also offers an example of a concern which has been able to secure both-way loads for this class of service. It has contracted with a large manufacturing company in Westchester County to deliver all of its products in New York City and as far out as Newark, N. J. It has similarly contracted with a Newark, N. J., manufacturer to deliver its first-class freight in the New York territory. By this means it is able to offer

The great increase in the use in motor trucks in the Metropolitan territory during the past year cannot be credited to an abnormal increase in any one particular industry, but rather to smaller increases generally. Good business conditions brought about by the change of the United States from a debtor to a creditor nation and the large increase in currency circulation has enabled many concerns to purchase motor delivery equipment. Department stores have been large buyers of trucks during the past year. Their patrons have demanded better and better service and the present prosperity has enabled them to purchase the higher priced motor delivery equipment to replace its horse vehicles.

Coal Dealers Bought Heavily

All concerns handling the necessities of life have been large purchasers of trucks during 1916, especially the coal dealers. The building trades have also invested in trucks to a considerable extent. Many of these vehicles have not been bought by the contractors themselves, but rather by general truckmen, who have hired them out at daily or monthly rates. One particular condition which has somewhat affected the

Representatives Who Will Attend Brooklyn's Motor Truck Show

(*Continued from page* 33.)

Represented by
J. G. Myers,
At Show.

PARTS AND ACCESSORY REPRESENTATIVES

Ahlberg Bearing Co.,
Chicago.
Represented by
P. J. Treiber, Mgr.,
1790 Broadway,
New York City.

American Taximeter Co.,
Represented by
W. E. McGuirk,
J. C. Butt,
Clarendon Hotel, New York City.

Clark Equipment Co.,
Buchanan, Mich.
Represented by
E. B. Ross,
Hotel Biltmore,
New York City.

Duplex Engine Governor Co., Inc.,
Brooklyn, N. Y.
Represented by
M. Farrell,
36 Flatbush Avenue Extension,
Brooklyn, N. Y.

Ericsson Mfg. Co.,
New York City.
Represented by
H. E. Walker,
51 East Forty-second Street,
New York City.

Fafnir Bearing Co.,
New Britain, Conn.
Represented by
A. J. Pickard & Co.,
1720 Broadway, New York City.

General Lead Batteries Co.,
Represented by
A. D. Stevenson,
Factory,
Newark, N. J.

Guaranty Securities Corp.,
Represented by
R. F. Brown,
Equitable Building, New York City.

George Haiss Mfg. Co.,
Represented by
John H. Lussen,
196 Westminster Road, Brooklyn, N. Y.

Master Carbureter Corp.,
Detroit.
Represented by
W. B. Tepoorten,
Cumberland Hotel,
New York City.

Mohawk Rubber Co.,
Akron, Ohio.
Represented by
J. Nehmelman, Mgr. Branch,
123 West Sixty-eighth Street,
New York City.

Ross Gear & Tool Co.,
Lafayette, Ind.
Represented by
H. A. Dick.
E. A. Ross,
Hotel Biltmore,
New York City.

Troy Wagon Works Co.,
Troy, Ohio.
Represented by
Troy Wagon Works Co.,
1876 Broadway,
New York City.

Vacuum Oil Co.,
Represented by
W. D. Flanders,
A. B. Ostrom,
61 Broadway, New York City.

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use of trucks in the Metropolitan area has been the passage of discriminatory motor truck legislation in New York State and similar proposed enactments in New Jersey. The New York State Registration fees have been increased from between 700 and 1400 per cent and while these large fees have proved a burden to a number of small users, it is not thought that they will tend to decrease the use of trucks generally.

This is because motor trucks have become such an economic necessity that legislators will soon discover that it is extremely poor policy to tax the most modern means of road transportation and one which will tend to decrease the alarming rise in our cost of living. New York State has already arranged to appoint a new commission to reconsider its present fees and to determine upon a new schedule which will apply to all users of the roads and not alone motor trucks.

Aside from the increased use of motor trucks, which will be demanded as the city expands, there is a large field for trucks in the replacement of the 113,907 horses which were in use at the beginning of 1916. While it is admitted that there are many places within the Metropolitan area where horse vehicles can be more economically used for loading and unloading, it is also evident that a large number of these horses can be replaced by motor vehicles.

Conservative Growth of New England Market a Thing to Bank Upon

Effect of War Business on 75 Per Cent Sales Gain

CONSISTENCY is a virtue in New England that is well reflected in the motor truck trade there. Perhaps other sections have shown a more spectacular increase in truck use, but nowhere else has there been a more consistent and permanent growth of motor haulage, all things considered.

New Englanders, in a patience-trying, but none the less intelligent conservatism, have adopted trucks only on their merits. Modernity for modernity's sake has never appealed to the Puritan mind. Rather he is inclined to cling to the established order of things until it has been clearly demonstrated that the newer order is the better order. Surely there can be no more satisfactory success than success in such a region; and there the truck has succeeded.

Business increase of some 150 per cent during 1916 over 1915 is the report from the most successful dealers in Massachusetts, Connecticut and Rhode Island. These same dealers anticipate an increase of 100 per cent over their 1916 sales during the present year. The latter expectation is well founded, furthermore, since in many cases it is based upon the actual allotment. One of the largest of the Boston dealers indeed has contracted for three times the number of trucks for 1917 sale as were sold last year and up to date has sold more than the allotment for the first 2 months.

Deliveries Greatly Delayed

Some account must be taken, however, of the unusual difficulty in getting chassis from the Western factories on account of the railroad tie-up.

Delivery over the roads has been made to a much greater extent than ever before. One company regularly delivers chassis to Boston from Philadelphia over the roads as far as New York, by boat to Providence and thence over the roads again to destination. With the break-up of winter, if the car shortage does not ease up, overland delivery may be expected to a still greater extent. A certain portion of the sales in 1917 are left-overs from 1916 and in normal times would have been included in last year's sales.

That these increases have not been general must, of course, be evident, since the reports were taken only from the leading twenty-two dealers in the six leading truck centers of New England, namely, Hartford, New Haven, Springfield, Worcester, Providence and Boston. Registration figures show that the number of trucks in New England increased 60 per cent during the year 1916. In some States the increase was higher than this, being over 100 per cent in Vermont and probably so in New Hampshire and almost that much in Maine. That Massachusetts lags behind the other States at this time is due to the fact that this State has always led in previous years and is accordingly more completely motorized than the other five.

It is unfortunate that New Hampshire has adopted a new scheme of registering motor vehicles, under which no distinction is made between passenger cars and trucks as in all of the other New England States and a few of the others.

The table on this page showing the growth of trucks in the Bay State gives a very good index to the consistent increase in motor haulage during the past 5 years. By this time next year there should be more than 20,000 trucks in Massachusetts and in excess of 55,000 in New England.

Perhaps nowhere else in the country would a sudden cessation of hostilities and a cancelling of war orders be less felt than in New England, for while the industrials there have taken a large part in the war supply business, they have proceeded with the utmost of caution and conservativeness, so typical of the region.

Among the causes for this increase, the greatest, naturally, is the increase in business prosperity which has been general all over the country. New England has had a great deal of war business which, though in itself but a small portion of the total commerce of the section, has had a far-reaching effect upon nearly all other lines of industry.

For example, it has brought more laborers into the States and this has stimulated the demand for all sorts of living necessities, with the result that retail, wholesale and manufacturing industries have had to increase their transportation equipment to keep pace with the growth in industry. There has been a great increase in the demand for buildings, both industrial and residential which has kept contractors, building material dealers and cement, brick, lumber and hardware manufactories busy. Much of this construction had to be done under great pressure and it is but natural that more and swifter transportation appliances should have been bought in large numbers.

Building Trades Leading Buyers

The building trades, indeed, have been the most conspicuous buyers of motor transportation equipment during the past year. No slump is to be looked for in this market, furthermore, because it has been impossible for the builders to keep anywhere near in step with the industrial development of New England and there is much building which is sorely needed which has had to be delayed.

Building costs have reached a very high level due to the scarcity of materials, poor railroad transportation and the premium at which building labor has been obtainable. The relaxing of the greatest pressure will have the effect of inducing many who have held off on making additions to premises to let contracts for buildings which have long been sorely needed.

Not all of the trucks which have been used in the building trades, however, have been purchased directly by contractors, etc. Many of these have contracted for their haulage with truckmen, so that general trucking concerns, or master truckmen, as they are locally termed, have been the largest actual buyers of motor trucks and tractors.

The haulage contractors have also used large numbers of trucks in the other stimulated industries. The great mills which have been working on the miles of cloth required for the war have contracted for much additional highway transportation. The boot and shoe fac-

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INCREASE IN MOTOR TRUCK REGISTRATION IN NEW ENGLAND, 1916

State	Number of Trucks		Increase	
	1915	1916	Number	Per Cent
Massachusetts	11,960	18,194	6,234	52.0
Connecticut	4,847	7,759	2,912	60.0
Rhode Island	1,620	2,855	1,226	75.0
Maine	1,000	1,991	991	99.0
New Hampshire	550	*	*	*
Vermont	358	728	370	103.5
Totals	20,344	31,527	11,533†	76.1† (Av.)

*Combined with passenger cars and so not available. †For five states only.

MASSACHUSETTS TRUCK REGISTRATIONS FOR 5 YEARS

Year	1912	1913	1914	1915	1916	Total Increase Number	Per Cent
Motor trucks	4,087	5,948	8,236	11,960	18,194	14,827	363
Increase, number	.....	1,861	2,288	3,724	6,234	Average Increase 3,527	45
Per cent	.....	45	38	45	52		

tories, the hat makers, the knitting mills, the paper mills, the lumber mills and all of the miscellaneous hardware and machinery factories have called upon the master truckmen for much extra transportation.

The munitions concerns themselves, including the many plants which have turned from other lines to the production of shells and shell parts, ordnance and parts, etc., have not only forced the haulage contractors to purchase more trucks than ever before, but they have themselves invested heavily in commercial vehicles.

To keep these industries running, great supplies of coal were required which has caused a very noticeable jump in the purchases of vehicles for fuel delivery. The railroad congestion has had a tendency to cause coal dealers to rely less upon distribution of the fuel to branch yards and to have instead more of it delivered to central bunkers from whence it has been delivered by motor truck.

There has been great activity throughout New England in the improvement and construction of roads and in this the motor truck has been in large demand. The public utilities companies have felt the effect of the boom in increased subscribers for telephones, greater demand for electric light and gas, extended and greater street car service, etc., and in the highway transportation requirements of these services have required more trucks.

Wholesalers Motorizing

Wholesalers of all sorts of commodities have found it incumbent upon themselves to deliver greater volumes of goods in larger territories and have naturally turned to the motor truck. The retailers have found their trade in suburban industrial centers increased and have consequently made greater demands, temporarily at least, upon the local package expressmen.

Small but important gains have been made in the purchases of trucks for ice delivery, by bakers and by wholesale dairies.

In inter-city trucking, important, though not large gains have been made. New England manufacturers and wholesalers have been forced to adopt motor trucks and tractors for hauls between cities because of the inability of the railroads to serve them due to their congested condition. That this method of transportation was never extensively employed before is due to the fact that most of the concerns who are now using the method had always used the railroad previously—for decades before motor trucks were even thought of and in spite of the efforts of the trade to induce them to make the change, they had pursued a policy of let well enough alone.

Inter-City Hauling

But railway congestion and car shortage made the railroad method so impracticable that motor haulage overland became a necessity. It may fairly be stated that the step has been taken by few for any other reason than absolute necessity, and not as long as the prevailing fear of the railroad and unwillingness to act in combination obtains among New England industrials will there be much hope of a boom in inter-city trucking.

Those who have adopted the system, however, are highly pleased with it and it is highly improbable that any of them will ever return to the archaic railway method of hauling over short distances again.

Some interesting examples of this work, its reasons and the character of service it represents are afforded by a few citations of work of this character now being done in New England:

Sidney Blumenthal Co., Shelton, Conn., is using Mack trucks for a haul of 14 miles to New Haven steamers.

The Mazda lamp factory in Pawtucket, R. I., uses Peerless trucks to transport its highly-fragile product to the docks at Providence for shipment to New York and the rest of the United States and over the road to Boston and Worcester.

The Sales Bleachery Co., Pawtucket, R. I., uses Federals to get its finished fabrics to Providence for marine shipment.

The Rhode Island Oyster Farms, Warren, R. I., send two truckloads of oysters to Boston every night on Autocar trucks.

The Ward-Corby Co., wholesale bakers of Providence, ship bread from Providence to Boston by Autocar truck.

The Mount Hope Finishing Co., North Dyton, Mass., having formerly received its raw cotton cloth from the New Bedford and Fall River mills, now uses Kelly-Springfield and Pierce-Arrow trucks to haul it overland and to haul the mercerized product to Boston. This has resulted in cutting out long delays. Now the mill gets its cloth every day and sometimes twice a day. The trucks make two round trips a day sometimes, the distance to New Bedford being 18 miles each way. The work is done winter and summer and so far the concern has figured a saving of 2 cents per 100 lb. over the railroad cost.

From Baltimore to Boston

The S. S. Pierce Co., a wholesale and retail fancy grocer of Boston, is to undertake the delivery of tins for tea from a Baltimore, Md., can factory to its Boston packing rooms by Autocar truck, the entire distance over the roads.

Walter Baker & Co., Milton Lower Falls, Mass., is using Packard trucks to transport chocolate 8 miles into Boston.

A. Balboni & Co., Norwood, Mass., located 18 miles out, uses Packard trucks for transportation between its plant and Boston.

Edward Bartlett, manufacturer of woolens, uses Packards to deliver his goods from North Oxford, Mass., to Worcester, a distance of 11 miles.

The William Carter Co., Needham, Mass., manufacturer of the well-known Carter underwear, is located 15 miles from Boston and employs Packard trucks to transport its product thence.

Gardiner & Beardsall, leather finishers, Nashua, N. H., use Packards occasionally for hauls into Boston, a distance of 40 miles each way.

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The Independent Oil Co., Brockton, Mass., hauls its product from that city to the Hub, 30 miles each way.

Walk-Overs Ride Over

The George E. Kieth Co., Brockton, Mass., employs Packard trucks to take Walk-Over shoes from Brockton to Boston, 30 miles.

Kibbe Bros. Co., the well-known confectionery concern of Springfield, Mass., which formerly used to distribute its goods by rail and then deliver it in horse-wagons drawn by four white horses, has cut out both the railway and the famous four-horse hitch and substituted fast pneumatic-tired White 1½-tonners, one of which goes as far south as New Haven. The concern started by trucking to Hartford, then pushed on down to New Britain and eventually reached New Haven and Waterbury.

H. L. Handee, a dealer in beef and provisions uses a fleet of White trucks to cover points between Springfield and New Britain.

Silver Bros., manufacturing confectioners of Hartford, Conn., employ White trucks for hauls between that city and Northampton, Mass., through Springfield.

The Henry G. Sears Co., Holyoke, Mass., a wholesale grocer, uses Whites to transport his wares to stores along a route from Holyoke to Greenfield, 30 miles.

Overland Expressing

The Hartford Dispatch, a highly-organized motor express line operates three Federals, a Packard, a Pierce-Arrow and a Stanley steamer between Hartford, Conn., and Springfield, Mass., there connecting with other lines from Springfield to Worcester and from Worcester to Boston.

The Bryant-Chapman Co., wholesale dairy, Hartford, Conn., employs Federals during the hot summer months to transport the lacteal fluid to New Haven. The milk reaches Hartford from Vermont farms in the morning. Formerly the best the railroad express could do was to get it to the Sound points in the middle of the afternoon. By using trucks it is delivered at breakfast time.

The 2-Tonner Leads

In New England the 2-tonner is the most popular capacity. New England dealers have found the Down-East Yankee less liable to overload than his New York neighbor.

In spite of some of his better known faults, the New Englander has many hardy virtues in a business way. He is difficult to convince, when to be convinced means to change the established mode of doing things, but once he has made a decision that step is based upon careful thinking and is not the impulse of the moment. With such a foundation he remains true to his original conviction. Having once bought one make of truck, it is very difficult to wean him away from it. The striking feature of the large New England fleets is that they are mostly of a single make, different makes being usually bought only when the capacity sought later is not obtainable in that originally selected.

Down-east Dealers Feel Independent of Shows

Yankee Buyers Demand Show—Trade Partial to Combination Exhibit

NEW ENGLAND is the stronghold of motor truck shows. Someone made a mistake when the show-me slogan was applied to Missouri. It belongs to New England. From the canny farmer at his county fair to the lady of society at her fashion salon, New England looks to shows to guide its purchases. This is the reason why every year the greatest motor vehicle show, from a retail standpoint, in the world takes place in Boston. This is the reason why, after New York and Chicago and practically all other cities of importance had abandoned the motor trucks show, Boston continued up until 1914 to hold annual truck exhibitions and why since that time, refusing to follow the example of other big cities, such for instance as Cleveland, she has continued large truck exhibits in connection with the passenger car show since that time.

Renewed Interest in Shows

Now with Brooklyn holding an exclusive motor truck exhibit and combination shows throughout the country reporting bigger entries of motor trucks than ever previous, New England is getting tired of truck shows. The exclusive truck show was abandoned in Boston because the attendance was so small and the expenses were so high that the truck show did not pay for itself. It was accordingly staged in the basement of the passenger car exhibition on the year following and every year since. By this means several advantages were gained.

The first was economy. But one set of officials, but one week of expense, but one set of decorations and but one week's rent of the hall was required.

Attracting the Crowd

Second to this, greater attendance was insured. At the old truck shows there was never a big crowd. Admittedly those who did visit the show were for the most part in earnest. They came there because they were expectant truck buyers. No one else, hardly, would think of going. But the crowd was so sparse and the appearance of the exhibit so forsaken after the preceding passenger car show that the whole atmosphere was discouraging. At the combination show there is always a crowd and the scene is one of activity and life.

The last advantage of the combination show is that it gives the dealers a chance to find new prospects. Attendance at the truck show was usually composed principally of prospects already known to be in the market. At the combination show it is different. Most of the visitors are interested primarily in passenger cars. Many who can afford private motors can also cover an investment in business vehicles. To many of these, motor trucks have never appealed and the idea of listening to a motor truck salesman has never been entertained. At the combination show a certain number of these, leaving their wives ensconced in limousines to discuss colors, upholstery and delivery with the Beau Brummel salesmen of the main floor, penetrate to the basement and acquire much lore from the square-jawed practical transportation men in attendance.

It would seem that with such an arrangement, Boston might go on holding motor truck exhibitions for many years, but unfortunately the industry grows apace while the available showing space is not increased. Unless larger quarters are found the associations which hold the shows will be obliged perforce to exclude trucks from future shows because of lack of accommodation for passenger cars. Already the trucks have been badly crowded at Boston. The space in the basement of the Mechanics' Building is none too attractive as it is.

In larger quarters, such as might be afforded by the gigantic new State Armory on Commonwealth Avenue or by the Rev. William Sunday's late tabernacle lie the only hope for continuance of the present combination show. Even then there will need to be a different sentiment among New England dealers if they are to be induced to continue supporting the truck end of it.

Small Local Shows Fail

Local shows, that is shows in the lesser cities of New England, have been practically tabooed insofar as trucks are concerned. Leading citizens from all parts of the section and a part of New Brunswick omitting a part of southwestern Connecticut alone, go to Boston for the annual show and the rural dealers are coming to depend upon Boston as the meeting place with those who insist upon looking around before signing on the dotted line.

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It is quite noticeable that dealers are more inclined to favor a show in a metropolis than in the home city. One of the reasons for this is that the show disrupts their organizations. Active field work practically has to stop during the show and little or no work can be done at the salesroom while nearly the whole staff is in attendance at the show exhibit. Another is that local business practically ceases 1 month to 6 weeks previous to the event and normal business does not resume for more than a week after it.

Exhibit Under Compulsion

Boston dealers in the majority, although most of them exhibit or try to, are opposed to the show, holding that it does not result in new business but simply holds up sales that should normally have been made during the month preceding it. Sales made at the show are usually practically closed beforehand, the actual deed being delayed until the cautious purchaser has improved the opportunity to inspect every other possibility to assure himself that he was buying with both sides of his money.

Besides these false show sales, there is another aspect of which one does not often hear. There are the prospects who come and see the other makes and change their minds. Some of these buy other makes and some become so confused that they do not buy at all. The dealers in old established lines which are continued year after year complain that the show exists as a means of permitting new and untried makes to make inroads on their market. Dealers in such debutante lines accuse the established dealers—who, incidentally run the show—of discrimination in the allotment of space. Although the Boston show is exceedingly representative of the trade in that city, a majority of the dealers exhibit under the compulsion of competition. If left to themselves they would stay out but they exhibit because their competitors, equally unsympathetically, also do.

In discussing the show question there are those who insist upon applying the acid test of sales made, while others stoutly maintain that the effect of shows somewhat like the effect of some classes of advertising cannot be accurately gaged by the direct results that can be traced. If the former attitude is adopted it becomes evident that the case for the show can be made to seem very poor indeed, for hardly any dealer will claim that the number of previously unsolicited sales made at the show pays for the expense of the exhibit. To the contrary, nearly all assert that without any show at all an equal number of chassis could be sold.

Always Had Shows

In conducting an investigation to determine the sentiment among New England dealers on this point, THE COMMERCIAL VEHICLE believed that these men were the best qualified to speak authoritatively on the subject of any because of their continuous experience with them, but in some ways many of these dealers are unqualified to pass an opinion because they have never had to get along without a show. They assume that all sales made at the show which were the result of previous work, would have been made in the natural course of events, without the exhibit. Those which are lost at the shows, these men insist, would have been closed were there no show to distract the buyer's mind from the carefully worked-up conclusions for which the dealer has labored. What proportion of these prospects might have remained lukewarm forever without the show these dealers are incapable of judging because they have not been through a showless year.

Experience of others who have done business both in territories and at times when shows were and were not held indicates that the show has a very wholesome effect upon these lukewarms and that while undoubtedly there is much exchanging of prospects at the show, the total number of sales made in the year is increased by the show. The effect of the show is to encourage the doubtful prospect by the object lesson in traffic modernization which is afforded.

Boston's Labor of Love

One undeniable injustice worked by the present show scheme is that out-of-town dealers and sub-dealers get the greatest good from the show, as the value of the exhibits to the small-city man is much greater than to the man who dodges trucks of all kinds all day in the metropolitan thoroughfares. Yet in spite of this it is the Boston dealers who must bear practically the entire expense.

But when all is said and done, the fact that Boston has had the greatest success with truck shows is due largely to local conditions and circumstance. For example, holding it in March is regarded by a considerable majority of the exhibitors as the best possible time. This is the beginning of the spring and the opening up of practically all of the roads. While the motor truck business is more and more of a year-round business, in sections where severe winter weather is encountered, the buying in the spring is bound to be heaviest.

Is Industry Beyond Shows?

Perhaps the most pessimistic view is held by those who decry the show idea as outworn. They insist that the institution is only useful to new industries or those which continually offer new things. The present development of the commercial vehicle trade, they hold, renders the show unnecessary because our business streets are a continual moving truck show. The need of the passenger car show, despite the relatively higher position in the scale of progress which the passenger car business occupies, is attributed to the frequent changes in chassis and the infinite variety of appealing body designs and color combinations, wholly lacking in truck exhibits.

A thorough insight into the show situation cannot be obtained from New England dealers alone. Most of these base their conclusions entirely upon experience in selling trucks with the aid of shows. Few of them know what it would be to sell trucks without this aid.

Accordingly it is instructive to compare their views with those of the dealers in New York and New Jersey in the metropolitan district—the dealers who are supporting the only truck show on earth.

Metropolitan Dealers Take Broad View of Truck Shows

Open-Minded, But Find That Routine Efforts Account for the Most Sales

SENTIMENT for and against either exclusive or combined passenger car and truck shows in the Metropolitan district of New York City is surprisingly similar to that in the New England territory in many respects. The dealers in both sections unanimously agree that the spring, preferably in March, is the ideal time for a truck show if one is to be held. This is because construction work of all kinds usually starts up in the latter part of March or the beginning of April. Contractors are one of the largest classes of users in the Metropolitan district and usually purchase their trucks just before the opening of the spring season, whether they are building new roads or erecting new buildings.

Another reason for March being the best month to hold a truck show is that the roads are at that time just getting in good shape after the winter snows. While the roads in the outlying territory tributary to New York City are in fairly good condition, they are wearing out very quickly, especially in New Jersey, and there are many with insufficient foundations to permit the use of heavy commercial vehicles much before the latter part of March or April.

Many of the New York City dealers are of the opinion that forceful truck selling every day of the year brings much better results than those secured from any variety of show. They also maintain that sales made at shows or to prospects secured at the shows are very small in number; that the time of the

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sales force usually spent at the shows could be put to much better advantage out in the field and that the card-index files of prospects now kept in the offices of most of the larger concerns bring much better results.

This is especially the case with combined shows for the reason that a large proportion of the visitors to the truck exhibits are merely sightseers who have no thought of purchasing any type of commercial vehicle.

On the other hand, other dealers maintain that even if these sightseers do not purchase trucks, they may eventually do so. They are at least interested in some form of motor vehicle transportation or they would not have attended the show at all.

Still other dealers maintain that shows of either the exclusive or combined variety are a good investment if only for the publicity accruing and the fact of being able to keep their makes of trucks in the public eye. This is borne out by the fact that of the thirty-two exhibitors at the Brooklyn show, nineteen are from New York City. Many of these do not maintain Brooklyn showrooms, so that the show offers a means of putting their trucks before the Brooklyn public.

Still other dealers insist that truck shows are of advantage principally to makers who are bringing out new vehicles and who wish to introduce them with all the glamour attending new articles seen at any kind of exhibitions.

As it stands at present, a large proportion of the exhibits are made by dealers who really expect to derive no benefit from the show but have been forced to show their trucks simply because their competitors will be represented.

Our London Letter

By R. Douglas-Vickers

BRITISH MAKERS JEALOUS OF AMERICAN SUCCESS IN ENGLAND—HARD TO GET PARTS OF U. S. VEHICLES

LONDON, Eng., Feb. 1—Beyond the tightening up of the restrictive regulations on imports, nothing very unusual has happened in the motor trade during the past 2 months. Unless the chassis are very urgently wanted for work of national importance, no permits to import are being issued by the authorities. The existing demand for trucks is being met out of such stocks as are held by importers, while a number of British makers are able to supply a portion of this output in certain approved cases.

From the reports I have received there is still an active business in all classes of commercial vehicles and British firms and agents have no reason to complain of the number of definite orders placed with them for execution as opportunity offers. Whatever may be the post-war position, the business that is now accumulating at the factories will be sufficient to keep makers busy for some time after the conclusion of hostilities.

These facts make it somewhat difficult to understand a good deal of the talk which has been indulged in as to the supposed loss of good-will which the home firms are supposed to have sustained in consequence of the war. Indeed, the contrary would appear to be the case, for I do not know of a single firm that has paid dividends of less than 10 per cent on the share capital with a bonus of a further 5 per cent, this, despite the amount levied under the Excess Profits Duty. Not only has the British Government purchased many thousands of motor trucks from the factories here, but they have been sent to Russia in considerable numbers—and it is only reasonable to suppose that additional goodwill has been secured in this way.

Urging High Tariff

Notwithstanding the prosperous state of affairs as disclosed by the foregoing facts, I notice that efforts are being made in quarters closely allied to the manufacturing element to push the claims of the high tariff exponents of the industry. A lively fear is expressed that American truck builders, having received the stimulus to increase productions brought about by the varied needs of the allies, will proceed to dump their surplus goods on the British markets. I do not know to what extent this fear is justified, but I do know that it is not shared by all makers in this country.

On the other hand, the vast factory expansions which have been made in order to cope with government needs will most certainly be put to profitable account, once they are freed, and I shall not be surprised to see production on a huge scale here with a lowering of prices. So far as I can gather there will be a general scrapping of methods and models. Before the war the British factory was prepared to produce far too many models to do so economically and it will probably be found that it will be content with two, or at most three types of chassis, for light, medium and heavy loads. Prices will also be subjected to a revision as soon as the production for civil purposes begins to have an effect upon the demands.

Farm Tractors Needed

Then again I foresee motor truck manufacturers turning to another outlet for their enterprise and energies. The farm tractor business is getting such an extraordinarily good push from the board of agriculture and the army council that the complete conversion of the farming community to motor tillage is only a matter of time. By the end of this year there will be probably 5000 farm tractors at work in the United Kingdom and most of them it may be stated at once, are of British manufacture. One of the first concerns to get to work here was the Overtime Co., and it has already disposed of 1000 or more machines.

One of the largest and finest parks here—the historic Richmond Park—is at present being plowed up with the aid of an Overtime tractor for the growing of grain or potatoes. The Mogul tractor is another machine that is being extensively adopted and it is also giving much satisfaction. All the importers of farm tractors are being strictly supervised by the department of agricultural machinery of which S. F. Edge is director. All the tractors that are available are being acquired by the county war agricultural committees and are being hired out to farmers at from $20 to $25 per day. This is said to be at the rate of from $4 to $5 per acre when plowing, a price which I understand allows of very rapid depreciation.

As soon as they get an opportunity of taking the matter up, a number of commercial vehicle firms contemplate the manufacture of farm tractors as a profitable side line. The Daimler Co. had taken up this branch of engineering before the war and had achieved a certain amount of success in it. No serious effort was made, however, and the war turned its energies into other channels. It will be very interesting to watch developments in this direction.

An American at the Helm

Speaking of the Daimler Co., it may be mentioned that Parry Martin, the managing director, is a native of the United States and well known on both sides of the Atlantic. He has just been appointed director of internal combustion engines in the Ministry of Munitions and it is generally felt in the industry that no fitter appointment could have been made. His great organizing ability, as well as his business capacity and technical knowledge, is beyond question, so that his services will be of immense worth to the Allied cause.

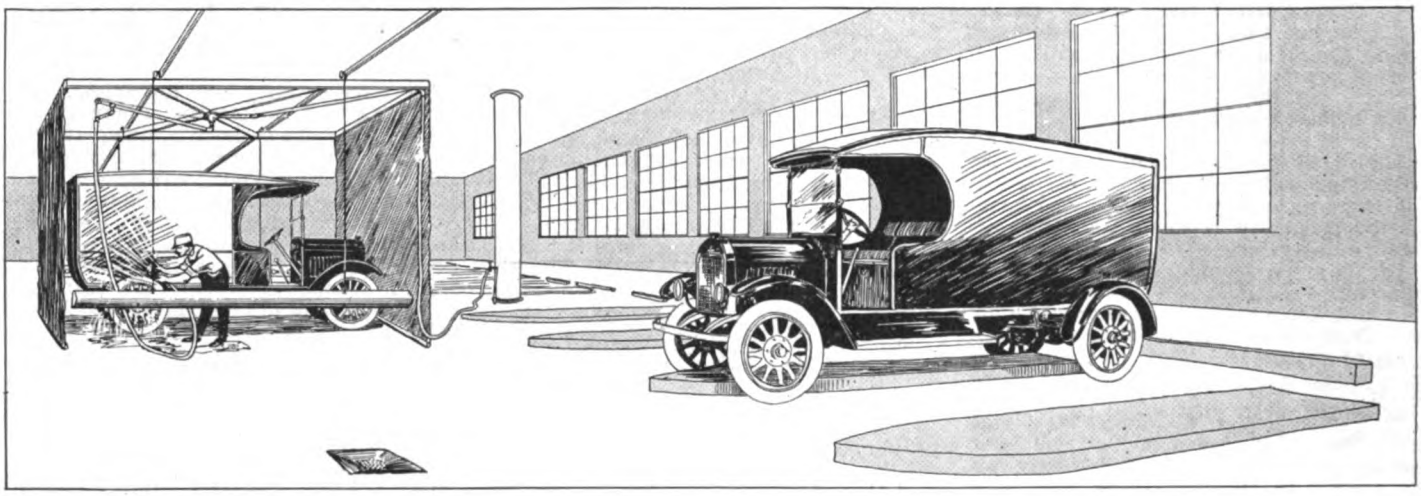
Statements are being circulated that users here of American trucks are unable or find it extremely difficult to obtain spare parts. If this is the case it will undoubtedly do the import trade considerable harm for there is nothing the business community so heartily resents as having expensive machines hung up for the sake of some trifling item which ought to be available locally. I need scarcely add that this argument is being used for all it is worth so that importing houses must see to it that their clients' interests are protected in every way. Hitherto, we have always been led to expect the utmost forethought on the part of those marketing American commercial vehicles, and it is to be hoped that the statements being made have no substantial foundation in fact.

American Tires Making Good

On more than one occasion I have referred to the operations of the Goodyear, Goodrich and Firestone tire companies and to the popularity which their products have achieved. Naturally this has roused the ire of their competitors who say that the great expansion in their business has been secured by reason of the fact that they allow dealers greater discounts on their tires than British firms do. So far as I can gather this does not fully explain the matter. For if it were true and the mileage results did not fulfil the claims made, a retrograde movement would by this time have become apparent. This is far from being the case and it can only be explained by consistent good service and quality. No further steps have been taken to impose a duty on imported tires which continue to come in free.

Various statements have been made as to the new motor factory which is to be established at Cork, Ireland, but nothing very definite is known as to what the program of the builders is likely to be. The promoters are the same people who early last year took a large factory at Trafford Park, Manchester, for the production of the Trafford truck—an assembled chassis made up mainly of parts imported from the United States. Their factory was commandeered by the authorities for war work and they were compelled to suspend operations.

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Perspective view of a modern truck garage showing the latest idea for washing vehicles by means of a movable washstand running on rollers on the ceiling beams. At the right are shown island platforms for automatically spacing the trucks in their proper positions on the floor. These platforms are made of concrete and are cast integral with the floor. They go between the vehicle wheels. The front ends are rounded off to act as a self-centering means while the truck is backing into position. The curtains and banks of electric lights suspended from the washstand framework are mounted on spring rollers like those on window shades. These permit them to be raised in a jiffy if a truck wants to pass down the aisle in which the washing is done to its stall behind the vehicle being washed

A New Way to Wash Your Trucks

Movable Washstand and Island Platforms for Spacing Are Latest in Garage Design

SHALL I wash my trucks in their places on the garage floor or shall I run them to a special washstand at one end of the floor? The solution of this problem has perplexed many motor truck owners, especially those operating fleets of ten or more vehicles.

The Latest Method

This troublesome problem has been solved in a new manner by means of a brand new method in which a traveling washstand supported on rollers running on the ceiling beams is moved up and down the aisle in front of the trucks. Curtains on rollers like those of ordinary window shades are suspended from the sides of the framework facing the fronts of the vehicles pointing toward the aisle, as shown in the illustration at the top of this page.

After the truck is moved straight out into the aisle, the curtains are lowered to prevent the water from splashing on any of the vehicles standing in their places. In case a truck enters the garage and wishes to pass to its regular stall behind the one being washed, it is but a few moments' time to release the curtains and have them move up to clear and then push the truck straight back into its regular place.

Two banks of electric lights, each in a long reflector of parabolic section, are suspended from the traveling framework at the ends. These reflectors are similarly hung on shade-like rollers and can be raised to clear in a few seconds in the same manner as the side curtains.

The usual procedure several years ago was to have one or more washstands conveniently located at one or more points in the garage and to run each of the vehicles in turn to either of them for washing. While this method did not offer serious obstacles when only two or three trucks were maintained, the time consumed and the labor necessary to shift from twenty to thirty vehicles from their storage stalls to the washstands every night meant a considerable expenditure of cash.

Time Lost in Moving Trucks

The excessive time consumed by this method was not used in the actual washing of the vehicles, but rather in snaking them in and out of their positions on the floor without starting their motors. Too, the work was usually done by the washers, not endowed with an especially large amount of knowledge or intelligence, and as a result scratched fenders and body mars were quite usual.

In an endeavor to eliminate the time and labor expended in moving each truck in and out of its stall on the floor every time it had to be washed, several of the large department stores, which usually wash their vehicles every night, tried the expedient of washing the trucks in their places on the floors without moving them.

Washing in Place Undesirable

At first this method might seem to solve the difficulty, but considerable trouble was experienced in washing only one truck at a time. It was simple enough to wash the first truck in a line of several backed up to the garage wall. However, when the men started to wash the one next to it, they found that some of the dirty water invariably splashed on the truck just previously cleaned. With trucks having highly-polished panel bodies such as are used in the department store trade, this meant going over the washed truck a second time. This, of course, added to the expense of washing and tended to offset the saving made by eliminating the movement of the truck from its stall to the washstand.

Poor Illumination a Drawback

Another disadvantage of the method of washing in place was that the illumination of the vehicle, especially the under portions, was poor. While with the ordinary washstand the one or more electric light reflectors could be turned to illumine any particular portion of the

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chassis, this could not be done so easily in the wash-in-place method because the lights were generally fixed in the ceilings or side walls and tended to light up the tops and ends of the trucks rather than the sides and under portions. This necessitated the use of electric lights on leads.

The washer had to hold the handle of such a light in one hand and the end of the hose in the other. This proved only partially satisfactory because the bulbs were often broken by the splashing of the water onto them and because the light only illuminated a fairly small area. Besides, the leads often got tangled up in the washer's feet or stuck on the fenders in moving from one side of the truck to the other.

All of these objections are overcome by the traveling washstand pictured on these two pages. The curtains on the sides prevent any of the dirty water from splashing on any of the vehicles facing on the aisle. The suspended banks of electric lights on each end enable any portion of the car to be exceptionally well illuminated by stopping the roller action at the desired height above the floor. Each truck need only be moved a few feet straight out into the aisle and without the necessity of steering it around any turns in getting in or out and without the danger of damaging the fenders or other exposed parts of the body. The water is carried to the washstand in a hose which may be attached to pipe connections at each column.

In Use in Gotham

The washstand pictured is in use at the new garage of the Hudson Motor Car Co., in New York City. While only passenger cars will be maintained in that structure, the novel washstand idea may be applied for use in a motor truck garage with but little if any change. The end, side and plan views given on this page show how the washstand is made. It is the design of Harry B. Mulliken, New York City, who has applied for a patent on the device.

Island Platforms for Spacing

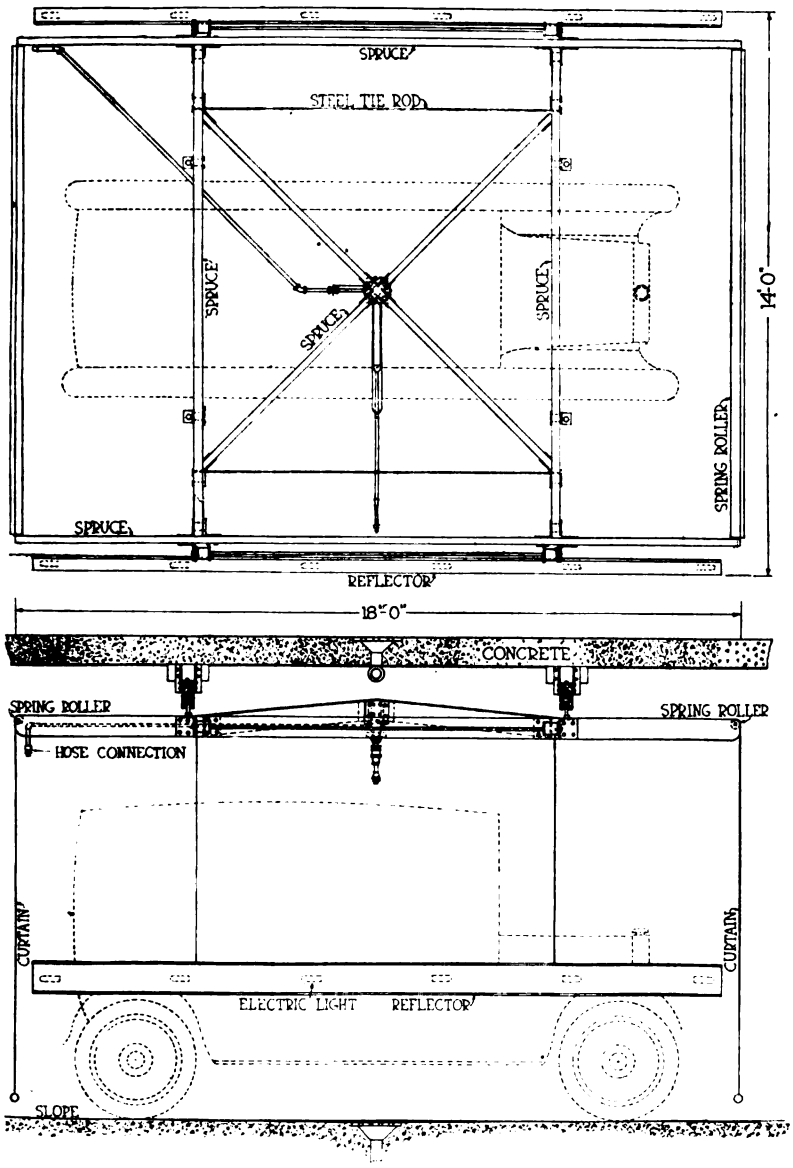
Besides the washstand idea, the garage is characterized by another novelty which can be applied to the motor truck garage with slight modification. This is the employment of small boat-shaped island platforms made integral with the floor, for spacing each truck in its proper place.

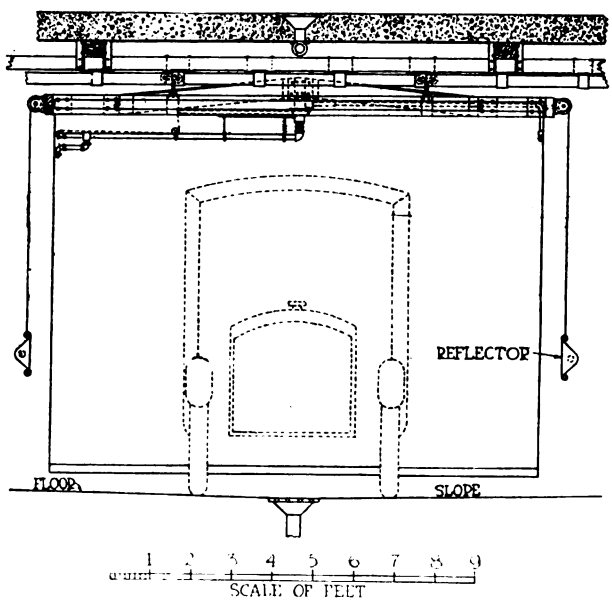
These platforms need be about 4 inches high, 12 or 13 feet long and sufficiently narrow enough to allow the wheels of the truck to straddle them. They are made of concrete and are sufficiently high to prevent the rear wheels of the trucks from mounting them when backing into place. The fronts are slightly rounded off to help center the rear wheels when the truck is backing into position.

As originally designed for use with passenger cars, the platforms were made exactly 49 inches wide, this being slightly less than the standard distance between the insides of the rear tires. The platforms were then spaced far enough apart to give sufficient room between adjacent vehicles for minor repairs and tire changing.

Platform Changes Necessary

Due to the variance in truck tread and the use of dual tires on some commercial vehicles, the platforms would have to be slightly narrower and placed a trifle farther apart. Concrete bumpers, also made integral with the floor, are employed to keep the vehicles from backing too far. Each bumper is placed between two adjacent platforms so that it serves to locate two trucks instead of but one, as would be the case were each one placed directly in back of its corresponding platform.





Side, end and plan elevations of the new type of traveling washstand, showing exactly how it is made. Note the method of mounting the upper framework on rollers which run in tracks suspended from the under sides of the ceiling beams. Note also how the curtains and electric light reflectors are carried on spring rollers. The water is carried to one end of the framework by means of a hose attached to take-off pipes located at each of the columns as the washstand is moved along the length of the aisle. From the end of the framework, the water is led in a small pipe to the center where a pivoted pipe is provided. The free end of this pipe carries the hose used by the washer who may swing the pipe around in a complete circle so that he may wash any part of the truck without getting the hose twisted

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Special Service



THE WHITE TRUCK • • • • IS EMPLOYED TO STOCK ALL OF THE STREAMS IN THE SAN BERNARDINO MOUNTAINS. THE FISH ARE RAISED AT THE STATE HATCHERY IN BEAR VALLEY. LAST YEAR 324,000 YOUNG TROUT WERE DISTRIBUTED BY THE TRUCK WITHIN 3 WEEKS

STOCKING streams with beautiful speckled trout for the pleasure of the disciples of Izaak Walton and carrying engineers engaged in astronomical work and in primary triangulation are the two usual tasks to which two installations of White trucks shown on this and the opposite page have been put. Both outfits had to meet operating conditions far more rigorous than those encountered in the everyday work of the commercial motor vehicle in large or small cities or even in overland haulage between distant points.

While motor trucks have been used in connection with government survey work for several years past, the use of a commercial vehicle for stocking western streams with the speckled beauties of the flashing mountain waters is a new means of accomplishing results heretofore thought impossible because of the trying conditions imposed upon vehicles of any kind.

Country of No Roads

These conditions are much the same in both the trout distribution and the triangulation work, with the latter perhaps a little more severe because a full or nearly full load is carried at all times. The most serious difficulties which the motor vehicles have to surmount consist of travelling over country which is practically without roads, and carrying on this work 15 or more hours a day in territory far removed from any points at which repair parts or mechanical help can be secured in case of accidents. The vehicles, therefore, have to be essentially self-supporting.

Truck Named Rainbow Special

The White truck used in the distribution of the trout is employed by the California State Fish and Game Commission to stock all of the streams in the San Bernardino mountains. The fish are raised at the State hatchery in Bear Valley. As soon as the young trout arrive at the proper age they are separated and divided among the numerous trout streams to keep them well stocked with the species so eagerly sought by all anglers.



THE FISH WERE TRANSPORTED IN CONVENTIONAL MILK CANS CARRIED IN A LOW-SIDED BODY AND LASHED IN PLACE TO PREVENT SLIDING BACK AND FORTH WHILE IN TRANSIT

Heretofore this work has been carried on to a smaller extent by the use of pack mules carrying the young fish in milk cans hung on either flank. This method was extremely slow due to the fact that the rugged mountain conditions restricted the speed of the animals almost to a walk.

Last year, when 324,000 young trout from the California hatchery had to be distributed, it was seen that the former method would have been much too slow. Accordingly a motor truck was experimented with for the first time. That vehicle, a ¾-ton White, driven by Fred Worthington and owned by San Bernardino County, distributed the entire allotment within 3 weeks. The vehicle worked 15 hours a day and made three trips each week. The fish were transported in conventional milk cans carried in a low-sided body and lashed in place to prevent sliding back and forth while in transit.

Truck Crew of Three

Two men besides the driver made up the truck crew. The truck itself ran to the nearest point along available roads to that at which the fish were to be distributed. Sometimes the truck was run across country to the banks of the stream

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but in other cases the cans had to be carried from the road to the stream and then emptied.

The conditions which the trout truck, named the Rainbow Special, encountered were not so severe as those which confronted the vehicles engaged in the triangulation work. To understand exactly the difficulties which had to be surmounted one must first have a mental picture of the work done.

Triangulation is for the purpose of determining the latitude and longitude of a network of points all over the country. It is also necessary to determine the exact distance between the various points plotted, which may be anywhere from 10 to 100 miles apart. These points then serve as master locations for all the surveys and maps of the region covered.

Trucks Reach Mountain Tops

Each point where observations are made must be visible from other stations many miles away. For this reason only the points of highest elevation in any particular region are used. The trucks were therefore made to jump from mountain top to mountain top, traversing main trunk roads where possible and then branching off into mere trails leading to the mountain summits.

Tires Greatest Expense

The vehicles illustrated on this and the opposite page were used by a party of engineers working from Ogden, Utah, to Portland, Ore., during the seasons of 1915 and 1916. Each vehicle carried on an average of 1800 pounds of instruments and camp equipment, although the total load often varied 300 pounds on either side of that amount. Interesting conclusions deduced from the operations of these two trucks during 1915 and 1916, as analyzed by the Coast and Geodetic Survey, show that tires constitute one-fourth the cost of operation and depreciation more than half.



EACH VEHICLE CARRIED ON AN AVERAGE LOADS OF 1800 POUNDS OF INSTRUMENTS AND CAMP EQUIPMENT, ALTHOUGH THE TOTAL LOAD OFTEN VARIED 300 POUNDS ON EITHER SIDE OF THAT AMOUNT

The trucks, of ¾-ton capacity, were equipped with 35 by 5 pneumatics all around. The tires averaged about 3000 miles, which gave a figure of 5.7 cents per mile for tire wear. This seems unusually high but it is borne out by actual facts which are well explained in a single incident which occurred last year. In the case mentioned at least $60 worth of tires were used up in a couple of hours. This happened on an extremely steep hill with practically no road. The nearest available team was 25 miles away, and with the cost of the engineering crew amounting to more than $50 a day it was considered far more economical to use up the tires and climb the hill rather than to lose 2 days in securing a team to haul the outfit.

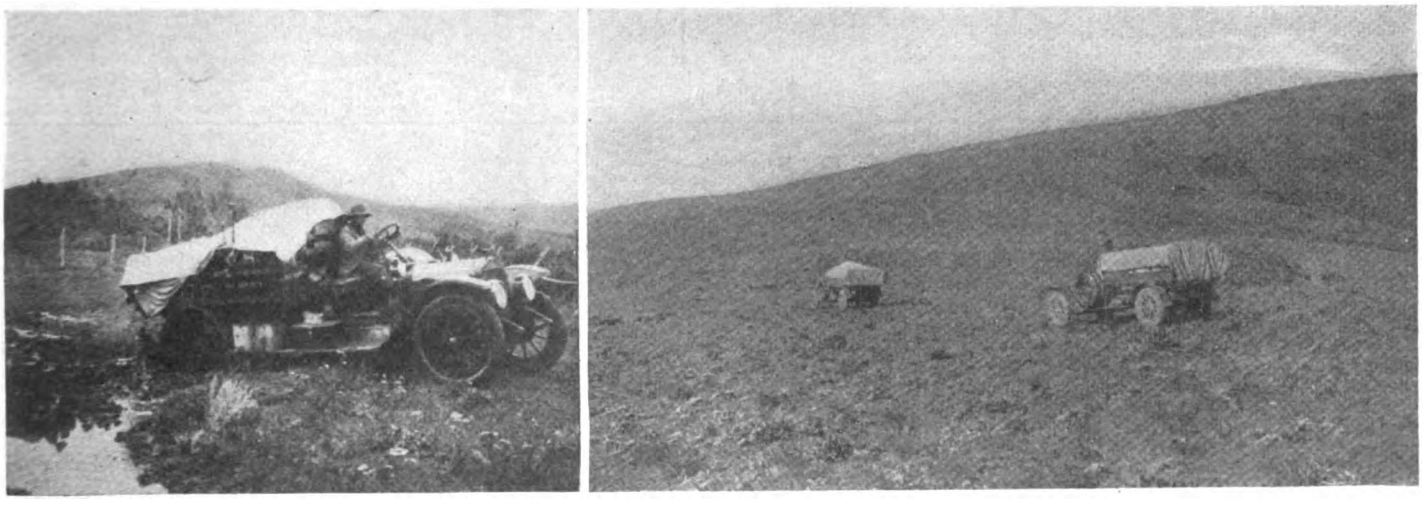
Low Gear Reductions Needed

One other important consideration often overlooked in selecting a motor truck for cross-country work is the gear ratio or the number of times the truck engine makes a complete revolution to every revolution of the rear driving wheels. The Coast and Geodetic Survey intends to change the gear ratios of the two ¾-ton trucks mentioned above from 5 to 1 to 7 to 1. It bases this decision upon previous experience gained in connection with the use of a 1½-ton truck whose final gear reduction was changed from 7 to 1 to 9¼ to 1 after a season's use. Although this reduced the maximum speed of the vehicle from 28 to 17 miles per hour, the average miles per hour and the number of miles per gallon of gasoline were both materially increased during the following season.

Other interesting deductions made by the Survey are that the life of the trucks will be equivalent to 18,000 miles of running and that the depreciation cost per mile amounts to 13 cents including accessories and tools, etc.

Trucks Average 4000 Miles Yearly

During 1915 and 1916 one of the trucks covered 8457 miles and the other 7800 miles. The average speed of the vehicles, including all stops except those for lunch, was 10.9 miles per hour and the miles per gallon of gasoline, and the cost per mile for gasoline respectively 10.6 and 10.3, and 2.1 and 2.2 cents in the order given. The cost per mile for oil and grease was respectively 56 cents and 60 cents. The total cost per mile, as calculated by the survey, was 22.62 and 23.3 cents respectively, these figures covering the entire 2-year period.



THE MOST SERIOUS DIFFICULTIES WHICH THE MOTOR VEHICLES HAVE TO SURMOUNT CONSIST OF TRAVELLING OVER COUNTRY WHICH IS PRACTICALLY WITHOUT ROADS, AND CARRYING ON THIS WORK 15 OR MORE HOURS A DAY IN TERRITORY FAR REMOVED FROM ANY POINT AT WHICH REPAIR PARTS OR MECHANICAL HELP CAN BE SECURED IN CASE OF ACCIDENT. THE VEHICLES THEREFORE HAVE TO BE ESSENTIALLY SELF-SUPPORTING

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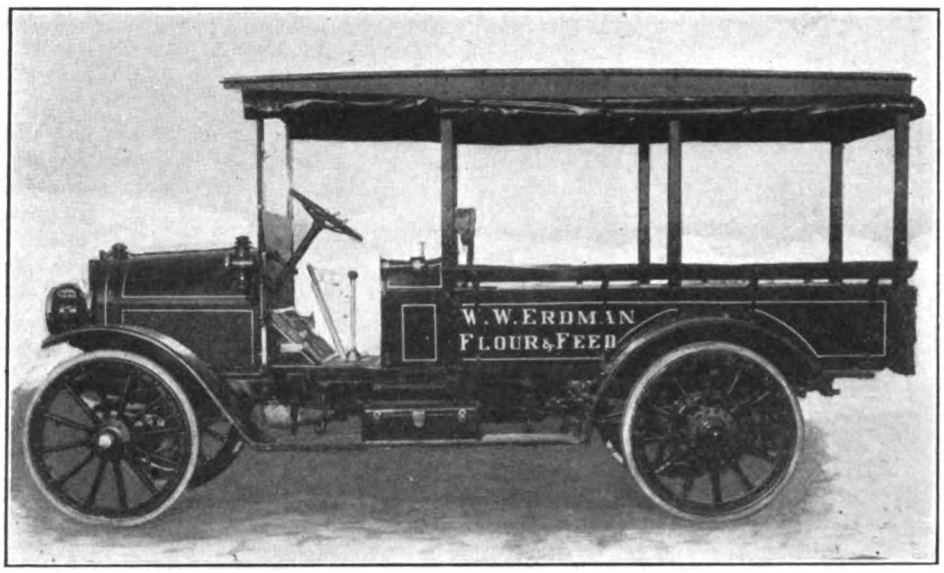


Fig. 1—Hahn ¾-tonner, an addition to the line, having internal-gear drive

HAHN SPECIFICATIONS

Capacity, lbs.	1,500	3,000	7,000
Price	$1,100	$1,950	$2,800
Wheelbase, in.	120*	144*	148*
Tires, front	36x3	36x3½	36x5
Tires, rear	36x3½	36x3½d	36x5d
Bore, in.	3	4⅛	4½
Stroke, in.	3½	5⅛	5½
N. A. C. C. hp.	14.40	27.20	32.40
Speed, r.p.m.	....	....	....
Speed, m.p.h.	....	15	12
Final drive	Int.-gear	Worm	Worm

*Other wheelbases optional.

Hahn Line Embraces Three Models, New ¾-Tonner, Others Bigger

Small Improvements Made—New Drive Used

SINCE November 1, 1916, when specifications of the 1- and 2-ton Hahn trucks were published in THE COMMERCIAL VEHICLE, the Hahn Motor Truck & Wagon Co., Hamburg, Pa., has brought out a new line of trucks, consisting of an entirely new ¾-tonner and re-designed larger models of increased capacity. The line now comprises ¾-, 1½- and 3½-tonners.

The powerplant of the ¾-tonner is a Continental engine in unit with its clutch and gearset. It is block cast with valves to the right, and is cooled by thermo-syphon circulation through a cellular radiator with a sheet-metal casing. Single ignition is supplied by an Eisemann or Bosch magneto, with hand spark advance. No governor is fitted. The Stromberg carbureter is fed by gravity from a tank beneath the seat.

The clutch and gearset are of Brown-Lipe manufacture, the former being of the dry-multiple-disk type and the latter of the three-speed selective pattern. A single shaft transmits the drive to the Torbensen internal-gear-driven rear axle, torque and propulsion being taken by the springs. Brakes are all on the rear wheels, the hand brakes acting internally and the foot brakes externally.

The truck is mounted on a pressed steel frame of the flexible type and has left steer and central levers.

The larger models have been changed from former construction in the fitting of a metal dash, sloping hoods, metal windshields and doors on the sides of the cabs if desired. The 1½-tonner's Continental engine is block-cast with valves to the right, and is cooled by centrifugal pump circulation through a cellular radiator in a sheet-metal casing. Either a Bosch or Eisemann single magneto with hand spark advance will be fitted.

Speed is controlled by a Pierce centrifugal governor driven from the engine and set to limit the speed to 15 miles per hour. The Stromberg carbureter is fed by gravity from a tank beneath the seat. The Brown-Lipe dry-disk clutch and three-speed selective gearset are incorporated with the engine and drive by a tubular shaft to the Timken worm-driven rear axle. The steering wheel is to the left with central levers.

In all important respects the 3½-tonner is like the 1½-ton model excepting in the engine. On the larger size this is pair-cast and has dual ignition. The smaller model also has Hotchkiss drive while the 3½-tonner has radius rods for propulsion.

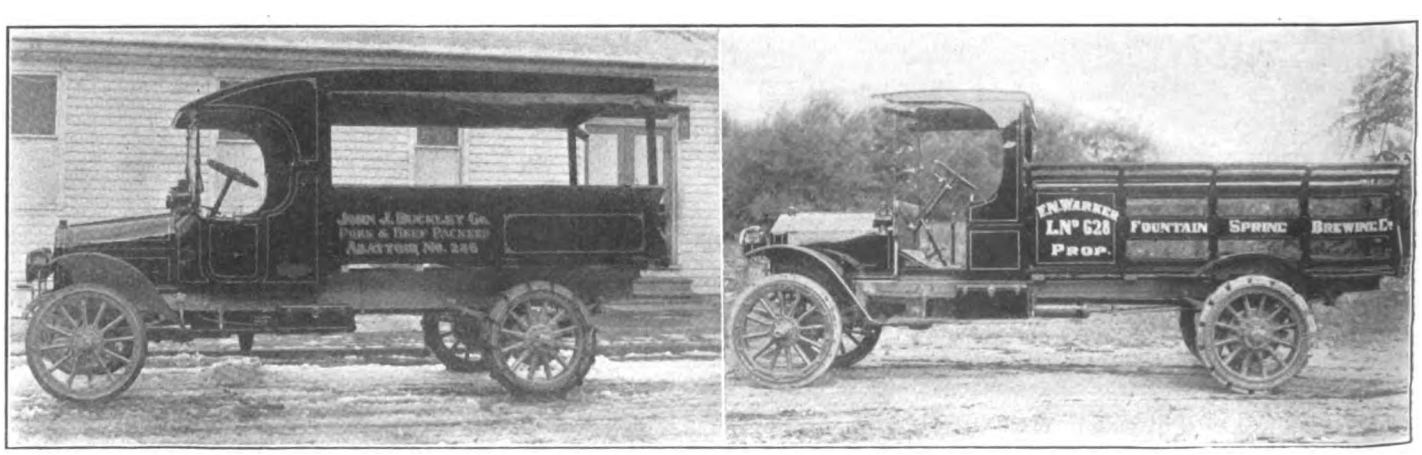


Fig. 2—The larger Hahn models, whose capacity has been increased: left, the 1½-tonner; right, the 3½-tonner, showing improved lines of hood and type of side-door cab which has been adopted

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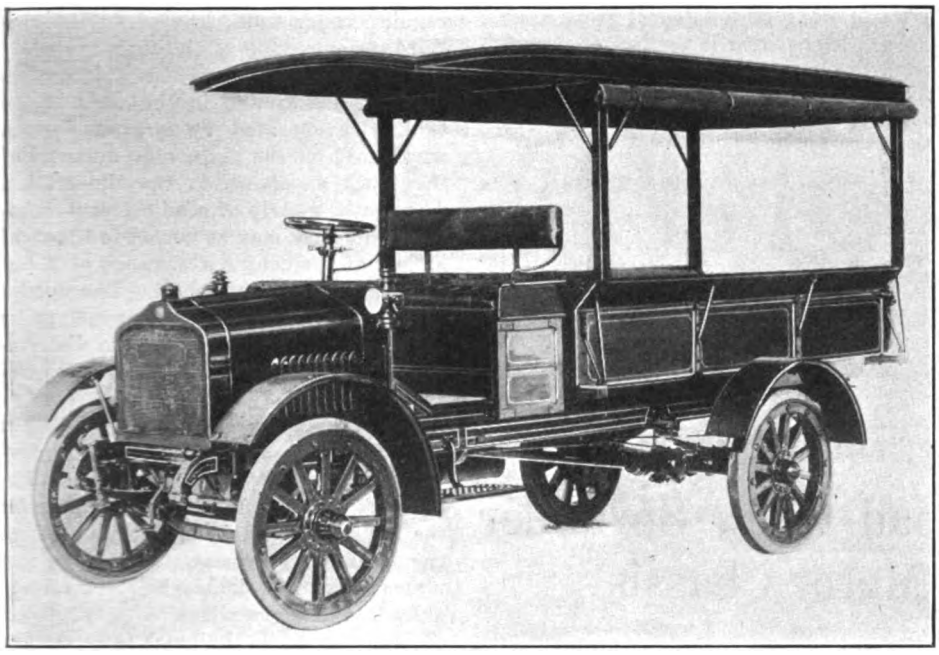


Fig. 3—New Selden 1-tonner, which has internal-gear drive. Note right-side steering wheel location

Two Wilson Models Brought Out

1- and 3-tonners Expand Line to Three Sizes

EXPANSION of its line to three models, but adherence to its original design, is the policy of the J. C. Wilson Co., Detroit, in announcing a new 1- and 3-tonner in addition to the 2-tonner which has been made for 2 years.

From exterior appearance, the three models are so similar except as to size that it is difficult to distinguish them. The same powerplant is used in the 2- and 3-tonners, the 1-tonner having a smaller one. It is a Continental engine with a dry-disk clutch and progressive three-speed gearset, mounted as a unit on three points. The cylinders are cast in block with valves to the left, and are cooled by thermo-syphon circulation through the finned-tube casting-incased radiator. A high-tension magneto supplies a single spark at a fixed advance. No governor is used.

The larger models employ a powerplant made up of a larger Continental, similar to the smaller one just described save that centrifugal pump water circulation is used and a centrifugal Pierce governor, driven from the motor, is applied. The magneto used on this model is an Eisemann and a Marvel carbureter, fed by gravity from a tank beneath the seat, is employed.

On the 2-tonner the clutch is a Hartford cone type, driving a three-speed selective gearset of Covert make. The 3-tonner has a progressive gearset of the same make mounted amidships to reduce the length of the driveshaft back to the axle.

Sheldon worm-driven axles of the semi-floating type are applied to all models with Hotchkiss drive through the Sheldon springs in each case. All have both sets of brakes acting internally, the brakes being side by side.

Wilson trucks have frames of rolled channel steel built so as to give the maximum of flexibility. They have Hayes wood wheels with square spokes. Their Ross steering gears are located to the left with the hand levers in the center of the cab. The characteristic Wilson hood and cab form is used. The dash is a shallow cowl built with a curve continuing from side to side. Spark and throttle levers are underneath the steering wheel.

WILSON SPECIFICATIONS

Capacity, lbs.	2,000	4,000	6,000
Price	$1,375	$2,350	$2,650
Wheelbase, in.	124*	144	144*
Tires, front	34x3½	36x4	36x5
Tires, rear	34x4	36x4d	36x5d
Bore, in.	3½	4⅛	4⅛
Stroke, in.	5	5¼	5¼
N. A. C. C. hp.	19.61	27.20	27.20
Speed, r.p.m.	1800	1050	1100
Speed, m.p.h.	18	13	14
Gear-ratio in high gear		8.6	8.6
Final drive	Worm	Worm	Worm

*Other wheelbases optional.

New 1-ton Selden Is Added

Has Internal-gear Drive and Lower Price

SIMILAR in all important respects to the worm-driven 1-tonner marketed by the Selden Truck Sales Co., Rochester, N. Y., excepting in the final drive, the new internal-gear-driven Selden 1-tonner is now offered at $1,385 instead of $1,700, the price of the worm-driver.

In either model the engine is of four block-cast cylinders with valves to the right. It is cooled by thermo-syphon water circulation through a square-tubular radiator in a sheet-metal casing. The clutch and gearset are incorporated with the engine in a unit powerplant

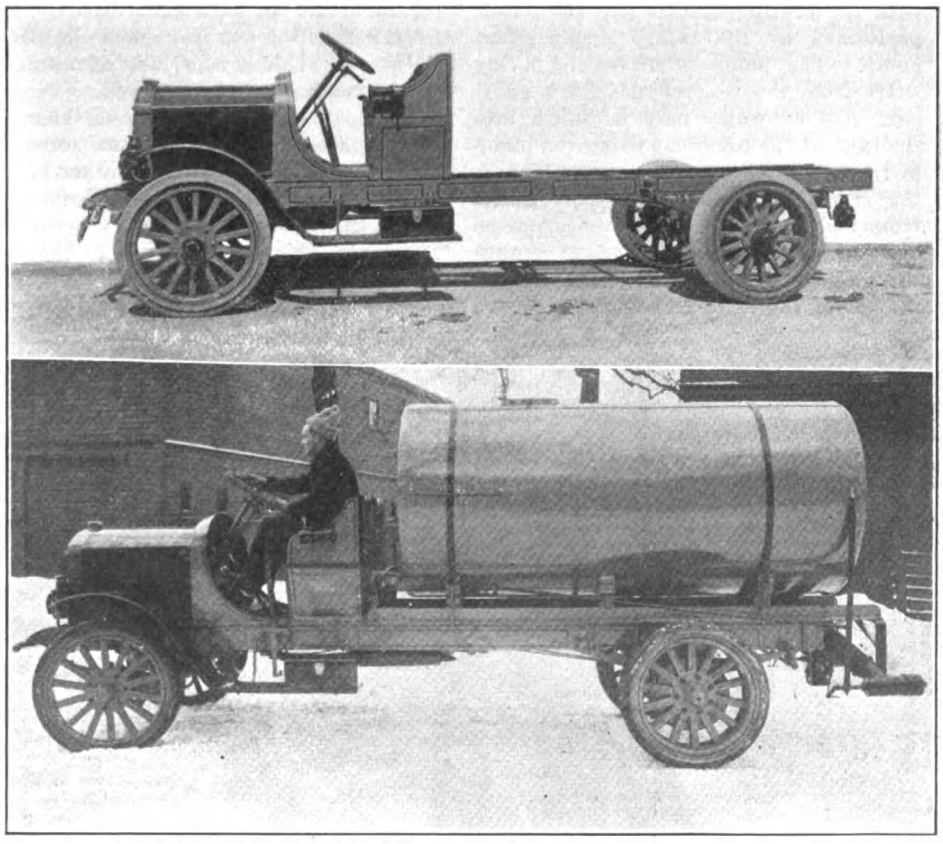


Fig. 4—The two new Wilsons. At the top is the 3-tonner and below the 1-tonner. Both are very similar in design throughout, carrying out the original 2-ton structure

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supported on a subframe at three points. A Stromberg carbureter is fed by gravity from a tank beneath the seat and ignition is supplied from a single Bosch magneto with fixed spark advance. The governor is driven from the engine and is of the Pierce centrifugal type.

Drive from the engine is taken by a dry-disk clutch and three-speed selective gearset through a single shaft with two universals. This shaft is of large-diameter tubing, thus avoiding the whipping that would result in a solid shaft of this length.

The rear axle is a Russel, the torque and propulsion being taken by the springs. The brakes are both on the rear wheels, the foot brakes acting externally and the hand brakes internally on the same drums. The frame is of pressed steel, with integral front spring horns. Right steer is used on this model, with the levers in the center of the cab. The steering column is braced by a bracket bolted to the dash. Light fenders are applied both front and rear.

SELDEN SPECIFICATIONS

Capacity, lbs.	2,000	2,000
Price	$1,700	$1,385
Wheelbase, in.	126½	131*
Tires, front	34x3	34x3
Tires, rear	34x4	34x4
Bore, in.	3½	3½
Stroke, in.	5	5
N. A. C. C. hp	19.61	19.61
Speed, r.p.m	1135	1300
Speed, m.p.h.	17	16
Gear-ratio in high gear	6.75-1	8.2-1
Final drive	Worm	Int.-gear

*140 optional.

New Combination Road Oiler, Sprinkler and Flusher on Motor Chassis

Keeps Tar Hot—Operated By Two Attendants

COMBINING the functions of a road oiler, a hot-penetration tar spreader, a street sprinkler and a pressure flusher, the newest municipal and road-making appliance of the White Co., is known as the combination road maintenance and construction truck. Besides the above functions, removal of the Kinney equipment permits the chassis to be fitted with a plain body for general haulage.

Two of the chief features of the new truck are the high temperature possible with the heating system and the duties performed by the rotary displacement pump. The pump is driven by a lay shaft from the rear of the truck gearbox. Oil or water may be taken into the tank at the top or by using the pump to force it in through an intake pipe at the front. In loading the tank direct from freight cars the truck need not be on a lower level than the cars, because the pump has a lift of 13 feet. While the oil in the tank is being heated the pump keeps the liquid in constant circulation, carrying it out the top of the tank down through a pipe at the side and back into the bottom of the tank. This agitation keeps the heavier oils from settling on the bottom of the tank and becoming thick or gummy. It also helps to heat the liquid in a much shorter length of time. After the oil has been turned off at the distributing nozzles in the rear of the truck the pump carries the oil remaining in the pipes back into the tank and an automatic drip trough falls, preventing any leakage of the oil to the street. This is especially advantageous in passing street crossings.

The heating system eliminates the need for separate heating plants, erected alongside the freight cars or by the road. It will raise the temperature of a tankful of material at the rate of 1 degree a minute and maintain 350 degrees steadily. It is located in a separate section on the rear of the tank and heat is distributed uniformly to every one of the regular boiler flues, located in the one-third lower section of the tank.

The distributing nozzles, sixteen in number, are located in the rear of the tank and operated by a man from a small seat on the right side and end of the truck as shown in the illustration. They cover a strip of road 8 feet 6 inches wide, and they may be moved to the right or left of the center a distance of 2 feet by means of a hand wheel. The nozzles throw a fan-like stream, one overlapping the other and insuring uniform distribution to the road while the 80 pounds pressure delivered by the pump drives the liquid down into the crevices, binding it firmly. Three sets of nozzles are furnished for different grades of work. The pressure gauge and the thermometer for the heating system are within view of the operator on the rear seat and he regulates them. A double bell system enables him to communicate with the driver of the truck while the truck is in motion.

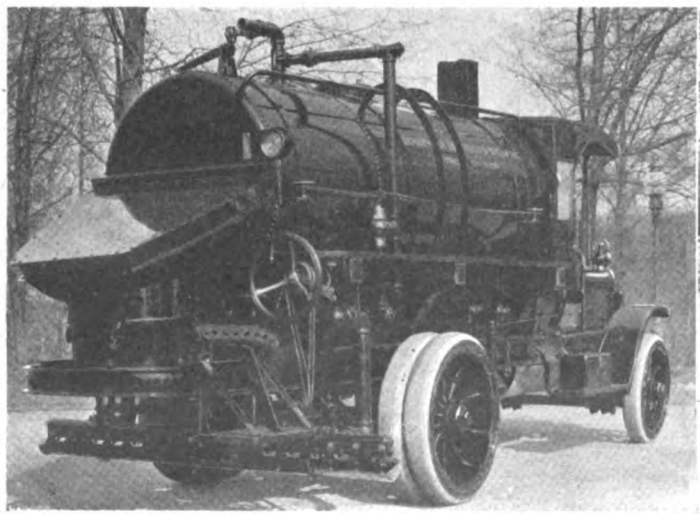
There are two sizes, one on a 3-ton chassis, with an 800-gallon tank and another on a 5-ton chassis with a 1,000-gallon tank. The tanks are made of heavy steel, hot riveted and calked inside and out. The 1,000-gallon size is 48 inches in diameter and 10 feet 6 inches in length.

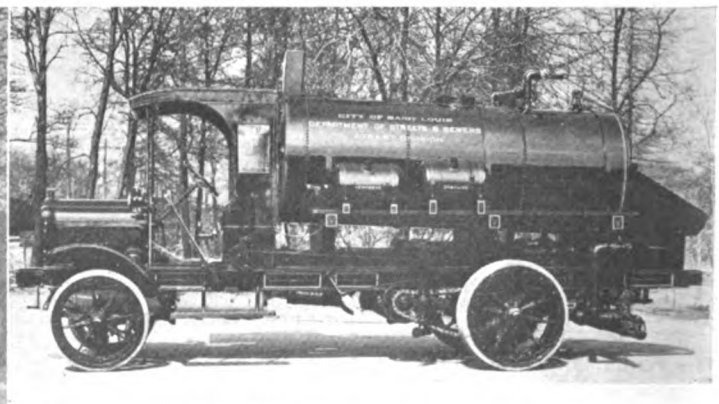
After the tank has been used for oiling it can be quickly cleaned by using the pump to circulate kerosene through it. A small tank of this cleaning fluid is attached to the left side of the truck.

In flushing the pump delivers 300 gallons of water per minute and covers a strip of road from 8 to 12 feet, while the sprinkling nozzles cover 20 to 40 feet.

FEDERAL ROAD AID UNRESTRICTED

WASHINGTON, D. C., Feb. 17—No restrictions are made on the kind of road a state must build in order to receive federal aid. Secretary of Agriculture Houston has issued a statement refuting rumors to the effect that only expensive construction would be aided by the department.





Two views of the White-Kinney road maintenance machine, showing heating outfit and position of rear operator in the left view and the general appearance at the right

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The Readers' Forum

Devoted to topics pertinent to commercial vehicle operation design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

MOST COST DATA WORTHLESS

Users Must Make Up Their Minds to Get Together and Learn

To the Editor, COMMERCIAL VEHICLE:

Have you any data on actual hauling costs for one- and two-horse teaming and deliveries? We have read a number of so-called estimated costs in a number of journals, but there seems to be such a wide range of figures in the ton-mile and daily operating costs that it is almost impossible to arrive at what a fair average is.—HENRY WIRZ, Indianapolis, Ind.

Owing to peculiar conditions prevailing among motor truck users and horse owners, it is impossible to secure sufficient data of this nature to arrive at any intelligent conclusion. Mr. Wirz's experience with estimated cost data which is published has been quite typical and it is for this reason that THE COMMERCIAL VEHICLE avoids estimated costs of that type.

The trouble is that users as a rule do not keep adequate cost accounts. Such accounts as they do keep are usually jealously kept in secret. Users as a rule are anxious to learn their competitors' costs and to learn the costs in other lines of trade similar to their own, but are very reluctant to give any information as to their own. This China wall attitude has never suceeded in any other result than resistence to progress and blind floundering in darkness. Most users have made discoveries that enable them to economize, but in the individual case, such advantages are more than offset by unsuspected leaks which other users have discovered and learned to stop.

The same condition has existed in other lines of industry and the leaders have recognized the folly of the every-man-for-himself-and-the-devil-take-the-hindmost policy. In such industries, notably the motor vehicle industry, co-operation and open discussion of common problems has resulted in tremendous advances. If it were not for the work of the Society of Automotive Engineers, for example, it is conceivable that motor cars today would cost twice what they do and they would be nothing like as satisfactory.

One of the great advantages of co-operation of this sort is standardization. Similarly one of the weaknesses of cost accounting is lack of standardization. There are usually several right ways of doing anything and it is natural that, left to their own devices, truck users should have undertaken cost accounting on almost as many different principles as there are truck users.

Clearly then it is hopeless to expect to find a comprehensive and thorough set of standard cost figures in existence. In spite of pretensions to this effect, no such thing exists and never will until users do get together, compare notes and adopt some standard method of keeping their cost accounts. The Federal Trade Commission has been conducting excellent missionary work along this line which it is to be hoped will bear fruit. The commission has given its sole indorsement to one system of motor truck accounting, published by this magazine. Perhaps the time will come when through this system and with the permission of its users to audit their books, THE COMMERCIAL VEHICLE may be able to secure sufficient cost figures to be able to conscientiously quote them through its columns.

But one does well to beware of so-called standard cost figures. Where there are essential differences in every feature of a work, there can be no uniformity of costs or performances and therefore no standards other than of methods of keeping costs. To take an average of 50 or 100 examples in a similar line of work would be of slight value to one user wishing to determine how normal his costs are. The only utility of such data is to indicate by analysis what costs may be expected under certain conditions so that one may by deduction approximate what they might be under a totally different set of conditions, or by the collection of data from a sufficiently varied array of circumstances be able to select from the records examples resembling the case under discussion. The inestimable value of such a file of data should be readily recognized by every business man, but unfortunately petty jealousy and a rather inflated opinion of their individual knowledge prevents the general run of users from making it possible, as yet.

DIFFICULT TO ESTIMATE COSTS

Not Enough Data Given By Bay State Dry Goods Men to Work On

To the Editor, COMMERCIAL VEHICLE:

If it is not too much trouble we would appreciate it if you would give us some idea as to the cost to deliver an average of 350 packages a day, which we believe would require three machines, and each machine would probably be required to cover 30 miles per day.

We figure that we have very good facilities for loading at the store and that we would be obliged to pay from $16 to $20 each for the drivers. We also might state that the streets and roads of Springfield are verv good for commercial vehicles, and that very little time would be lost by blockade or congested traffic.—R. E. DOANE, assistant treasurer, Albert Steiger Co., Springfield, Mass.

Without a first-hand study of the conditions it is impossible to do more than give a rough estimate of what it might cost under certain empirical conditions. In giving this estimate, THE COMMERCIAL VEHICLE wishes it to be understood that these figures are in no sense intended as average figures or indicative of what the costs would actually be in the case of the Steiger company; but only as a basis for that concern's accountants to work upon, comparing the assumed figures in the estimate with those which are actually found in the experience of the company, so that by a process of elimination it will be possible to arrive at a fair estimate of the expected cost.

It must be assumed that all of the premises stated in Mr. Doane's letter are correct and that three vehicles will be necessary. How this is determined is not stated; but it must be granted to start with that these three vehicles will each make a normal mileage for such capacity, that they will average a reasonable moving factor and will make the usual two trips per day apiece.

It takes an average of 2 minutes per stop in dry goods delivery, study of this subject has revealed. The stops will occur every ½ mile in Springfield, it is thought. A truck should be able to average a running speed of 12 miles per hour, or ½ mile in 1/24 hour, or 2½ minutes; so that each stop will take 4½ minutes of the truck's time, including the run to the next stop. Loading should not consume more than 45 minutes per trip. If three trucks deliver 350

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packages per day and it takes 300 calls to deliver them; each will make 100 stops per day, or fifty on each of two trips. If it takes 4½ minutes to make one delivery, then to make fifty will require 225 minutes or 3 hr. 45 min. Adding to this 45 minutes' loading time each trip is seen to consume 4½ hr., making a 9-hr. working day for the drivers plus whatever time is necessary to get from the garage to the store in the morning and back again at night. If there are 100 stops per day for each truck and such stops are ½ mile apart, the mileage will then be 50.

The type of truck for this service would be a light, pneumatic-tired vehicle capable of 30 miles an hour in open country on the return trip. Whether it would have ½ or ¾ ton capacity depends upon the weight of the maximum load to be carried in the holiday season—easily 100 packages. If groceries, hardware and other heavy articles constitute any considerable portion of the goods handled, one or more of them might have to be of 1- or 1½-ton size.

We may assume that all three are of 1500-lb. size. The average price for such chassis on the 1917 market is $1200. The body will cost, say, $200 and miscellaneous equipment $50. Suppose the tires to be 34 x 4½, costing $42.50 each. These may be assumed to run 3500 miles each. With this data and the other assumptions which will be found, we may make up a monthly statement as is shown in the reproduced form of the COMMERCIAL VEHICLE Standard Cost System for Motor Trucks given on this and the opposite pages.

The insurance rates here are for reasonably full coverage at standard rates, the collision policy having a $25 exemption clause under which collision damage to the truck amounting to less than $25 is not indemnified.

This statement covers one truck. The cost per working day of delivering 350 packages in three such trucks would therefore be three times Item 15, given on the form on the opposite page, or $44.20. The cost per package would be 12.6 cents—a rather high figure.

Undoubtedly the cost as here figured is high, as it will no doubt be found that the mileage here calculated is high. For example, it might be found that the average stops per mile were more than two, in which case the mileage covered would be less than here given and the cost less. In this case, however, judicious speeding up of loading operations and cutting down of delivery time by such means as providing each deliveryman with change to expedite C. O. D. deliveries might permit the same work to be done with two trucks instead of three. In which case it is likely that the cost per package would be less.

In a previous letter it was stated that this work was now being done by a delivery contractor for 8 cents per package. If the contractor can afford to do it for this and still make a profit, then the Steiger company should be able to do it for less, unless the contractor is using the same vehicles for the delivery simultaneously of goods from other houses.

With more definite information on the more important of these doubtful points, THE COMMERCIAL VEHICLE would be pleased to go into the subject again and on surer grounds. Discussion of these figures by other dry goods stores is especially invited.

MONTHLY TRUCK

Month ending _____ 19____.

Make of truck _____ Gasoline / Electric

THE COMMERCIAL VEHICLE—TRUCK COST SYSTEM

Operating Charges

Gasoline	200 gals.	@ 30¢	$ 60	00	
Current	kw-h.	@			
		@			
Oil	30 qts.	@ 20¢	6	00	
Grease	5 lbs.	@ 25¢	1	25	
Kerosene	1/3 gals.	@ 12¢		04	
Waste	6 lbs.	@ 18¢	1	08	
Dist. water	gals.	@			
		@			
Washer	12½ hrs.	@ 16¢	2	00	
Driver	27 days	@ $3	8 1	00	
Helper	27 days	@ 2	5 4	00	
		@			
		@			
Mechanic	6¾ hrs.	@ 50¢	3	37	
A—Total operating charges					$ 208.74

Maintenance Charges

*Tires 1485 miles @ $.0486	$ 72	17	
Repairs	10	00	
Overhauling, painting, etc.	7	50	
Spare vehicle rental			
Garage rental (pro rata)	40	00	
B—Total maintenance charges			$ 129.67

Fixed Charges

Insurance, fire @ $30 per year	$ 2	50	
Liability @ 93 per year & Prop. Dam.	7	75	
Collision @ 34 per year	2	83	
Interest @ 6 % (On Item 1 ÷12)	7	25	
Depreciation on chassis @ 20 %	20	00	
Depreciation on body @ 20 %	3	33	
Depreciation on equipment @ 20 %		83	
*Depreciation on tires @ %			
Total taxes and licenses	15	00	
C—Total fixed charges			$ 59.39

*Note: Omit one of these.

Reduced reproduction of monthly summary sheets of THE COMMERCIAL VEHICLE Cost of Albert Steiger Co., Springfield, Mass. In

TO STUDY PARCEL DELIVERY

Southerner Wants Data on Methods of Conducting Co-operative Scheme

To the Editor, COMMERCIAL VEHICLE:

The writer has a young brother in the South who contemplates entering the business of parcels delivery by motor truck. He has a little capital, but absolutely no experience and practically no business experience of any sort. Consequently I wish to secure for him as much information as possible about this business in order that he may educate himself along these lines.

Will you advise me of the names of any articles which have appeared recently in your magazine which would be of value to him? Also please advise me how I may obtain copies of such articles.

He will be interested in all phases of the subject, that is, not only the matter of cost of upkeep, business system, etc., but also how to get business and what arguments to lay before merchants to secure their co-operation.—HUNLEY ABBOTT, New York City.

The business which the young Southerner contemplates embarking upon is almost a virgin field, for while attempts to establish services of this nature have been made many times and some of them have been moderately successful, their numbers are few. The largest and most successful example of co-operative delivery is that of the Clearing House Parcel Delivery Co., Boston, Mass., described

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COST SUMMARY

Number of truck_____

Capacity in lbs. 1,500 Chassis No. _____

THE COMMERCIAL VEHICLE—TRUCK COST SYSTEM

Investment	
Cost of chassis, less tires	$ 1 030 00
Cost of body	200 00
Cost of equipment	50 00
Cost of tires	170 00
1—Total cost, complete	$ 1 450 00
Performance Record	
2—Days operated	87
3—Days idle	4
4—Days maintained (Item 2+Item 3)	31
5—Total hours operated	243
6—Total miles covered	1,485
7—Total trips made	84
8—Total [illegible] stops	2,700
Performance Averages	
9—Average miles per day maintained (Item 6÷Item 4)	48
10—Average miles per day operated (Item 6÷Item 2)	56
11—Average miles per trip (Item 6÷Item 7)	27.5
12—Average [illegible] stops or packages per trip (Item 8÷Item 7)	50
13—Average commercial [illegible] stop-miles per trip (Item 11×Item 12)	1,375
Recapitulation	
14—Total expenses for month (Sum of Items A, B and C)	$ 397.80
15—Cost per day operated (Item 14÷Item 2)	14.733
16—Cost per day maintained (Item 14÷Item 4)	12.51
17—Cost per mile operated (Item 14÷Item 6)	.266
18—Total commercial [illegible] stop-miles (Item 7×Item 13)	74,250
19—Cost per commercial [illegible] stop-mile (Item 14÷Item 18)	$ .0053

System for Motor Trucks, showing possible figures for a ¾-ton truck installed in the service full size the sheets are the size of this page

in the leading article of THE COMMERCIAL VEHICLE of Dec. 1, 1916, under the title: "Achievement of Success in Parcel Work Due to Co-ordinated Efficiency." As long as these issues last, they may be secured from the publisher at 20 cents per copy.

In any business these things are requisite to success: Knowledge of the business, gained either through experience or study, preferably, but not necessarily the former; capital, which may be owned by the promoter or interested by his efforts; proper equipment and means to operate it efficiently, and a field in which to conduct the business.

It may be taken for granted that the field exists, for wherever there are competing department stores there is high delivery cost because there is inefficiency due to duplication of effort and a certain amount of delivery service at a loss in order to gain profitable trade. The same thing applies to a somewhat modified degree in house furnishing, hardware, grocery, meat and produce, bakery, clothing and a host of other fields.

A knowledge of the business presupposes an ability to select the right equipment and to operate it effectively and economically. Such a knowledge does not necessarily have to be possessed by the heads of an enterprise; but may be secured from hired experts. In this way, if it comes at all, it comes high and there is always the danger of losing the expert and with him the prime requisite of success—a mental requisite, not easily replaced.

A foreknowledge of what costs are likely to be is impossible without a very thorough survey of every detail of the work, on the ground. Such a close estimate is not essential, however, for it may be taken as axiomatic that co-operation is always more economical than competition, and that is what a delivery clearing house effects. Furthermore the great growth of the commercial vehicle industry attests to the essential economy of motor delivery, otherwise the present volume of sales would be impossible.

The main precaution to be taken is to see that the trucks are operated in the most efficient manner; that they are selected intelligently for just the work they will be required to do and that when installed they will be so routed as to employ every minute of the day with useful work. Idle standing time is the thief of profits in motor transportation. Adequate means must be provided for giving the vehicles constant and effective care to conserve their mechanical well-being. Competent and reliable drivers, familiar both with delivery work and with truck operation are essential to effective and economical use of commercial vehicles.

Comprehensive, accurate and standard records and accounts are most essential, for the concern which does not keep threads between the bookkeeper and every department and operation of the business is driving ahead more or less in the dark and will sooner or later land in the ditch. Among such records, but by no means the sole essential, is a proper account of costs and performance of the trucks, such as provided in a simple, complete and standardized form by THE COMMERCIAL VEHICLE Standard Cost System for Motor Trucks.

STREET FLUSHERS AND SWEEPERS

Sweepers Mostly on Special Chassis—Flushers Are Appliances

To the Editor, COMMERCIAL VEHICLE:

Can you tell me where street flushing and sweeping equipment for application to motor truck chassis can be secured?—L. N. H., Buffalo.

The greater part of street-flushing apparatus is simply attached to standard motor truck chassis in connection with a water tank. Three concerns make a specialty of such fittings:

The Kinney Co., Boston, Mass.

Studebaker Bros. Co., South Bend, Ind.

Tiffin Motor Truck Co., Tiffin, Ohio.

The following concerns manufacture special street-sweeping machinery in connection with motor truck chassis specially designed for this service:

Baker Mfg. Co., Springfield, Ill.

W. E. Baxter, Los Angeles, Cal.

Elgin Street Sweeper Co., Elgin, Ill.

Sanitary Street Sweeper Co., Oakland, Cal.

Sanitary Vacuum Street Cleaner Co., Minneapolis, Minn.

Clarence L. Smith Co., New York City.

Way-Cleanse Co., Sandusky, Ohio.

The Kindling Machinery Co., Milwaukee, Wis., produces an outfit which is applicable to standard motor truck chassis.

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Accessories for the Truck

Stewart Handy Worker Five Tools in One

FIVE tools, comprising a drill press, vise, pipe vise, anvil and metal cutter, all of which are mounted on a stationary base, are combined to form the Stewart Handy Worker. The machine tools may be revolved at three different speeds by a handle operating through a train of gears. This makes a useful, portable repairshop tool. It is manufactured by the Chicago Fexible Shaft Co., Chicago.

The machine is equipped for operating emery wheels, scratch brushes, buffing wheels and the like. The vise jaws are 4 in. wide and faced with steel. They open up to 4½ in. and are operated by a hand wheel.

The device is planned to meet the requirements for doing repair work around the farm, shop, garage or home. It is especially adapted for use in repairing motor vehicles.

The outfit weighs 90 lb. and can therefore be easily carried in a vehicle. It is packed in a substantial case complete with all tools, attachments and directions as to their use. The price is $12.50. The device is shown complete in Fig. 3.

NEW EASYON TRUCK CHAINS

The 1917 Easyon tire chains for pneumatic tires, made by the Woodworth Mfg. Corp., Niagara Falls, N. Y., have several improvements over the similar type offered for sale in 1916. These are single chains, which are fastened to the spoke with leather covered fasteners. The chain which goes over the tire has a new type of specially-designed gripping member which is rounded and perfectly smooth at the part next the tire, but which has ends that stick out and take a deep hold in the mud and snow. The gripping member is made of ⅛-in. stock.

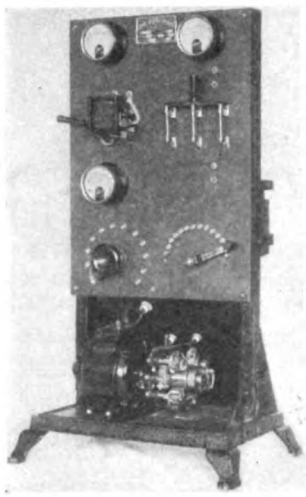


Fig. 1—Double circuit type of Stahl rectifier

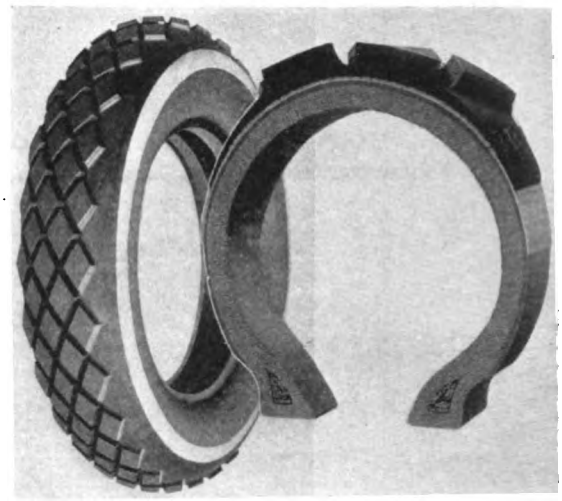


Fig. 2—Section and exterior view of new Goodyear cord pneumatic tire for trucks

In view of the fact that only four of these chains are normally required for use on each rear wheel, it is only a matter of a minute to make the adjustment when so desired.

The concern also makes a chain for solid truck tires. The feature of this type is that it consists of a double chain. The large cross chain of heavy twisted links goes across the tire tread, and the device is held to the spoke by a smaller leather-covered chain. These two parts are locked in place by being slipped over a double-bar fastener, and held there by a small snap, which can be fastened and unfastened in a moment.

The solid tire chains are made in five sizes: Small, for tires no larger than 3 in., medium, for tires 3 in. to 5 in., large, for tires 5 in. to 7 in., small dual chains for dual tires smaller than 4 in., large dual chains for dual tires larger than 4 in.

The chains may be bought singly or in sets of eight. The prices for the various sizes are: Small, 50 cents each, $4 per set; medium, 75 cents each, $6 per set; large, $1 each, $8 per set; small dual, $1.25 each, $10 per set; large dual, $1.50 each, $12 per set. The chains may also be purchased in sets of ten or twelve.

The pneumatic tire chains come in a small size for 3 or 3½ in. tires, $3 per set of eight; medium size, 4 or 4½ in. tires, $4 per set; large size, 5 or 5½ in. tires, $5 per set.

Stahl Rectifier Charges Battery Easily

A SIMPLE rectifying apparatus of the alternating current type is being manufactured by the Stahl Rectifier Co., Chicago, for garagemen who offer a battery charging service to their patrons.

The essential features of the device are a small synchronous motor, operating from the alternating current line. This turns a shaft provided with collector rings and a direct-current commutator. Alternating current is brought to the collector rings through brushes, taken from the rings and passed to the commutator, and finally taken off from the commutator as direct current by another set of brushes.

The switchboard, mounted on the same frame, is provided with all the necessary switches, regulating devices, measuring instruments and automatic features.

The output of this rectifier is an interrupted direct current of such a nature that it does not harm the battery if the latter is charged faster than at the indicated rate. To charge a battery it is necessary only to insert a cable plug and close a single switch.

The motor needs no attention in starting other than to close the line switch. The motor then starts and falls into synchronism immediately and remains so regardless of variation in voltage.

The single circuit type will charge from one to five batteries or up to a total of 15 cells at a time. By taking out each battery when completely charged and putting a new one in its place, a total of 13 fully-charged batteries can be turned out on the average in 24 hours, allowing for the average amount of residual charge in each. This type is sold at $135. The larger two-circuit type, with double capacity, sells for $185.

CHAMPION SPARK PLUG CLEANER

Spark plugs can be readily cleaned by the Champion Minute spark plug cleaner, manufactured by the Champion Spark Plug Co., Toledo, Ohio. There is no need to take the plug apart and the novice as well as the mechanic can use this device. It consists simply of a

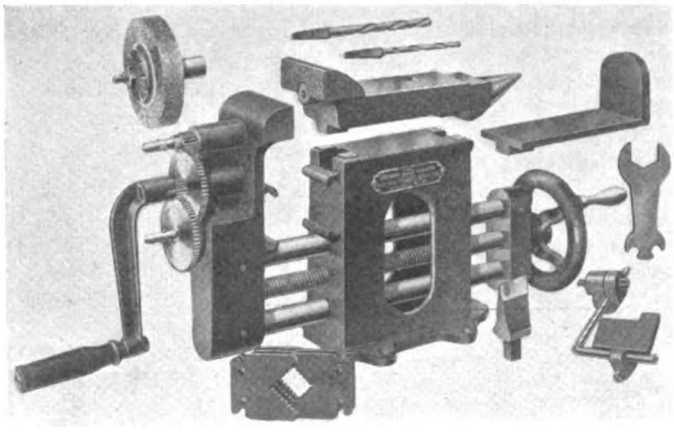




Fig. 3—Stewart Handy Worker in the dis-assembled state, showing the many attachments

Fig. 4—Champion spark plug cleaner applied to a plug

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special glass tube about 5 in. long with a bushing in the open end into which the spark plug is screwed. The tube contains about fifty steel needles and should be filled with gasoline before the plug is inserted. The plug is cleaned by inserting it in the glass tube and then shaking vigorously for a minute or so. The needles pick the carbon from the porcelain and the gasoline is used to dissolve the oil deposit.

Baker Wheel Is Made of Pressed Steel

A PRESSED steel tension wheel for use on motor trucks is being designed by the Baker Wheel & Rim Co., Chicago. The product has not yet been put on the market. It is being built on the same general principles as the model which this company is now demonstrating for passenger cars.

The basis of the wheel is a single sheet of steel from which the entire wheel is punched and drawn with the exception of part of the hub and one of the hub flanges. In the assembling process alternate spokes of the wheel are bent to opposite ends of the hub, thus putting the metal in each spoke under tension. The model, therefore, is really a suspension wheel operating on the same principle as the wire variety, although it has the appearance of the wood wheel.

A demountable rim structure is provided of novel construction. For rim mounting purposes the felloe is cut at one point and a turnbuckle used for the purpose of closing up the narrow opening while the rim is being applied. By this means, for instance, in a 30-in. wheel the circumference is reduced about ⅛ in., permitting the rim to be slipped into place and bedded on the felloe band. By reversing the turnbuckle the wheel is allowed to expand to its normal size again, thus locking the rim in place.

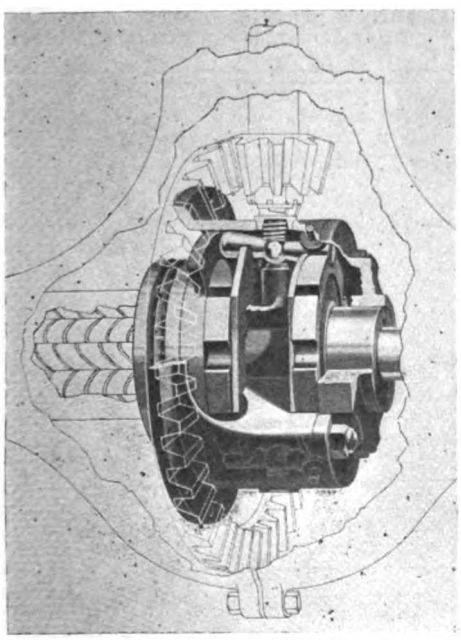


Fig. 5—Type of Bailey differential now being marketed, showing ratchet and pawls

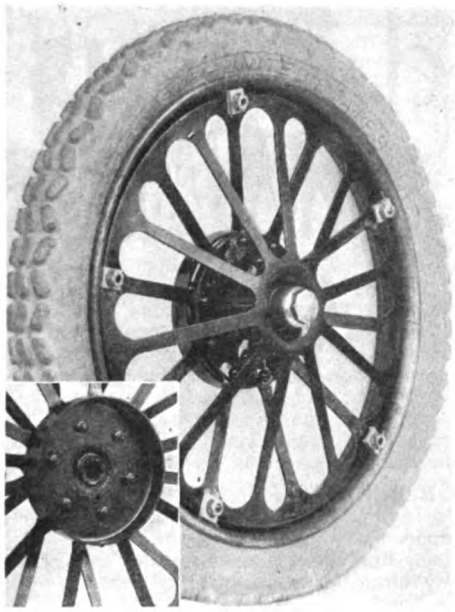


Fig. 6—Baker pressed-steel wheel of the demountable rim type with pneumatic tire

Driving studs are introduced on either side of the tire valve. On the opposite side of the wheel on either side of the turnbuckle are bolted latches which engage slots in the rim and prevent the latter from being thrown should the wheel be insufficiently expanded within the rim.

In the models designed for truck use the spokes that are attached to the inside of the hub are wider than those forming at the outside. This is because the former take up the driving torque most directly.

The inner flange of the hub is drawn integrally with the brake drum. The hub is of double-conical form when welded, and is afterward forced out to a cylindrical shape and proper size. This is accomplished by means of compressing the metal in the hub itself and adding to the tension of the spokes.

A wheel of this type offers the advantages of lightness, strength, resiliency and low cost. Without altering the basic structure, a number of varieties in design can be obtained. The passenger car type of wheel and the type of hub construction is shown in Fig. 6.

Bailey Differential Of Ratchet Type

BAILEY differentials are now being manufactured in types to fit the Ford, Chevrolet and Overland cars, and plans for making further types are under way. The Bailey Non-Stall Differential Corp. is the manufacturer, and the new address of the company is 1124 Michigan avenue, Chicago.

This device was invented by George D. Bailey, formerly chief engineer for the Commerce Truck Co., the Poss Truck Co. and the Clinton Motor Car Co. The first Bailey ideas in differentials were put into operation 5 years ago.

The basic principle of the Bailey differential is a pawl and ratchet mechanism which throws the power of the engine to the wheel which gets the best traction. In this respect it differs from the common type of differential which gives the power to the wheel encountering the least resistance. The advantage of the Bailey mechanism is that in case of one wheel getting into the mud, or any other slippery place, the wheel which has the good traction pulls the vehicle out. On the other type of differential the wheel which has the poor traction spins without accomplishing anything but waste of fuel and tire damage.

Goodyear Cord Tires for Large Motor Trucks

A NEW cord pneumatic tire for use on all types of commercial vehicles is being introduced by the Goodyear Tire & Rubber Co., Akron, O. The company has been making large pneumatic tires for motor trucks for some time. At first these were constructed in the fabric type only, but experimentation led to the adoption of the cord type construction to obtain better wear and greater strength.

The tubes for these tires are made by the laminated process, that is, thin sheets of pure gum built up layer upon layer, designed to prevent air holes and blisters. They are extra heavy and of uniform gage. These tires are built only in the straight-side type.

The claims held out for the use of the pneumatic tire are that it makes a high rate of speed possible and also causes less wear and tear on the vehicle. These factors are important in buses, sightseeing cars and fire apparatus, where the competition of other comfortable and quick modes of transportation must be met.

The tires are adapted for use on trucks of lighter models, having from ¾ to 2½ tons capacity. Four sizes are offered: 36 by 6, carrying a maximum load of 2275 lb. with 100 lb. inflation; 38 by 7, carrying a 3000 lb. maximum load with 110 lb. inflation; 40 by 8, carrying a 3925 lb. maximum load with 120 lb. inflation, and 42 by 9, carrying a 5000 lb. maximum load with 130 lb. inflation. The ideal load in each case would be from 225 to 350 lb. under the maximum, with 10 lb. less inflation.

There are from 10 to 16 plies of cords on each tire, according to the size of the tire.

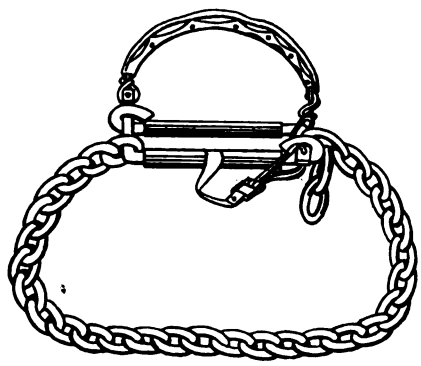


Fig. 7—Easyon truck tire chain

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Men and Makers

CHASE Motor Truck Co., Syracuse, N. Y., has issued a catalog containing a number of photographs of the Chase truck doing various kinds of commercial work. The truck is pictured in use as a bus, an oil tank carrier, a fire truck, a moving van, an express vehicle and as a delivery truck for many kinds of commodities. In the center is a photograph of the chassis, around which are grouped views of the various parts of the truck.

Garford Motor Truck Co., Lima, Ohio, has reorganized its Eastern distribution system. Rodney Hallam has been made manager of the New York office, which is now a factory branch serving the Greater City, eastern New York State, Newark, N. J., northern New Jersey and New England. C. B. Harvey will take charge of the sales organization for the territory.

Willys-Overland Co., Toledo, Ohio, has purchased the experimental plant of the Libbey-Owens Sheet Glass Co. at a cost of over $165,000. The purchase anticipates further expansion of the company.

Brockway Motor Truck Co., Cortland, N. Y., is planning a one-story cement block addition, 50 by 200 ft., to its machinery shop.

Dart Motor Truck Mfg. Co., Waterloo, Iowa, has traded $10.000 of stock to Fred Graef, of Riceville, Iowa, for five farms in northern Iowa

International Harvester Co. of America, Boston, Mass., has issued a neat booklet on International motor trucks showing the uses to which they are being put. The catalog describes the trucks and its parts in full, and is illustrated with half-tone engravings.

Wichita Falls Motor Co., Wichita Falls, Tex., has adopted a new policy for its Pacific Coast business which it will no longer handle through independent dealers, but will operate from direct factory branches. J. L. Glazier, formerly Wichita dealer in Portland, Ore., will manage the San Francisco branch, and Harry Glazier will be in charge at the Sacramento office.

Canadian S.K.F., Ltd., has been organized for the manufacture and sale of S.K.F. self-aligning ball bearings in Canada. The headquarters are at 47 King Street, West Toronto.

Barry B. Cann, Columbus, Ohio, has taken the central Ohio agency for Packard trucks, and will maintain a large service station for trucks at 235 North Fourth Street.

Overland Perrin Co., Mankato, Minn., has been recently formed, with a capital of $40,000, to act as agents for the Willys-Overland Co.

Van Dorn & Dutton Co., Cleveland, specialist in gears and gear cutting, has recently moved into a new plant in the east end of the city. The buildings are of fireproof concrete, brick and steel construction. The main factory building is divided into two sections. The front is 50 by 250 ft.. two stories high, and is devoted chiefly to the production of motor vehicle and tractor gears. The rear section is one story in height, 80 by 250 ft., and is used for shipping, receiving and making the heavier type of tractor gearing. To the rear of this is the main stock room.

Kelly-Springfield Motor Truck Co., Springfield, Ohio, has named H. W. Moore & Co., Denver, distributer for Kelly-Springfield trucks in Colorado, Wyoming, New Mexico, Montana and parts of Idaho and Utah.

Hudford Canadian Co., Toronto, Ont., is the sole distributer for the Province of Ontario of the Hudford 1-ton unit.

H. J. Koehler Motors Corp., Newark, N. J., has placed the San Francisco agency for the Koehler 1-ton truck with the Motor Truck Sales Co. and the Los Angeles agency with H. G. Pendell.

J. C. Wilson Co., Detroit, has placed the agency for Wilson trucks in northwestern Ohio with the T. A. Cooper Sales Co.

Markel-Maxwell Co., Columbus, Ohio, has been formed for the purpose of selling the Smith Form-a-Truck, and has leased a storeroom at 173-175 North Fourth Street.

Fischer-Griffin Storage Battery Co., Cincinnati, Ohio, has increased its capital from $10,000 to $50,000.

Blue Ribbon Body Co., Bridgeport, Conn., has been organized to take over the property and business of the Blue Ribbon Auto & Carriage Co., Bridgeport, Conn. Additional land has been bought and new buildings are to be constructed. The same management and policy will be continued as have been heretofore observed.

Westinghouse Electric & Mfg. Co. will erect a plant on the 500 acres recently purchased at Essington, Pa. The initial buildings, with equipment, will cost about $5,000,000, and will occupy about one-fifth of the land.

Hayes Mfg. Co. will redeem on April 1 bonds given under a mortgage bearing the date of April 1, 1913, at their par value, with accrued interest and a premium at the rate of 3 per cent of the par value of each bond.

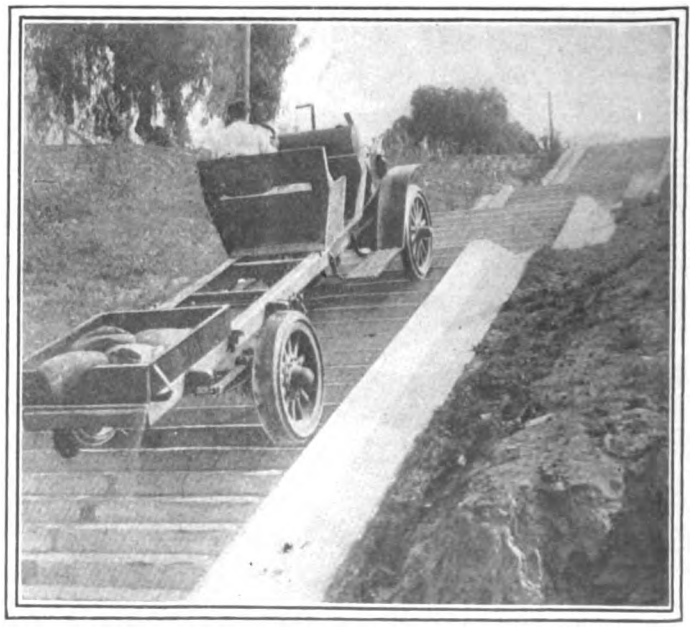
Columbia Motor Truck & Trailer Co., Pontiac, Mich., has decided to increase its capital from $35,000 to $100,000. G. F. Clark has been elected president of the company, Frank Carroll vice-president, and Leigh Lynch secretary.

General Tire & Rubber Co., Akron, Ohio, has appointed the Berrodin Rubber Co., Philadelphia, distributer for the General tire in eastern Pennsylvania, southern New Jersey and Delaware.

India Rubber Co., Akron, Ohio, has been capitalized at $125,000, and proposes to spend $100,000 on a plant it intends to build on 13 acres purchased for that purpose near Mogadore, Ohio.

Gordon Tire & Rubber Co., Canton, Ohio, has purchased 3 acres of land, on which it will build additions to its plant. There have been a number of shifts in the executive force. C. W. McKone has been made general superintendent; he was formerly plant superintendent. H. R. Platt has been made superintendent of the tire and rubber department; he comes to that office from the Batavia Rubber Co. W. E. Ballsbaugh, formerly with the Star Rubber Co., succeeds M. B. Clark, who has resigned as superintendent of the drug sundry department.

McGraw Tire & Rubber Co., East Palestine, Ohio, is reorganizing its ex-



Spectacular and somewhat sensational, the test being given the truck shown above was of considerable practical value in testing the Russel internal-gear-driven axle with which the vehicle was fitted. The scene is laid at the Marathon street steps, Los Angeles, Cal. The steps, set with 12-in. risers, on a 40 per cent grade, gave the rear axle considerable hammering and pounding in the truck's ascent and descent

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ecutive force. R. G. Nelson has been appointed assistant sales manager. He was formerly New York district manager, and is to be succeeded by W. V. Logan, formerly St. Louis, Mo., manager. The company has named C. E. Pumphrey, of the Atlanta, Ga., branch, for the St. Louis office, and T. J. Harris, special representative, is to take charge of the Atlanta district.

Victor Rubber Co., Springfield, Ohio, manufacturers of tires, tubes and rubber mats, will build a second story to its plant, which will more than double the present manufacturing floor space.

Bower Roller Bearing Co., Detroit, has declared a 100 per cent stock and a 15 per cent cash dividend.

Electric & Auto Parts Co., Morgan & Wright Tire Rim & Wheel Co. and Economy Metal Stamping Co., all of Cleveland, Ohio, have combined with several other manufacturing companies to build a community in the outlying districts of the city, where each will construct factories.

Bradford-Ackerman Corp., Forty-second Street Building, New York, has been formed to represent manufacturers of motor vehicle accessories for the domestic and export trade. A. H. Ackerman, formerly vice-president and general manager of the U. S. Light & Heat Corp., and C. C. Bradford, formerly sales manager of the same company, are the founders of the new organization.

Perpetual Spark Plug Co. will build a $30,000 factory, 30 by 174 ft., in Dunmore, Pa. The plant will have a capacity output of 30,000 plugs per day.

Nice Ball Bearing Co., Philadelphia, Pa., plans to build a factory on a site recently purchased.

W. A. Bryan has joined the factory executive force of the Firestone Tire & Rubber Co. He was formerly superintendent of the motor truck plant of the International Harvester Co.

F. E. Dayton has been named general sales manager and director of the Ajax Rubber Co., to succeed J. C. Matlack, whose resignation was accepted at the recent annual meeting of the company.

J. E. Baum, recently elected president of the Empire Tire Co., Trenton, N. J., will devote his entire time to that business. He has accordingly resigned as president of the Supplee-Biddle Hardware Co., Philadelphia, Pa.

W. P. Woodside has been made superintendent of plant 4 of the Studebaker Corp., Detroit. He was previously with the Crucible Steel Co.

Milton Van Keuren has been placed in charge of the Firestone branch at Albany, N. Y.

D. C. Goff will represent Winther trucks in the Southern territory for the Winther Motor Truck Co., Kenosha, Wis. Mr. Goff was until recently with the Nash Motors Co. in a similar capacity.

A. R. Wendell has been appointed manager of the Buffalo, N. Y., branch of the Pennsylvania Rubber Co.

J. P. Scearce has been appointed district sales manager for the Metz Co., in charge of California, Oregon, Washington, Idaho, Montana, British Columbia and Alaska. He has been manager of the Seattle branch of the Metz Co., and is succeeded in that office by William Bradshaw.

Alford A. Goenner has been named as distributer of Jeffery trucks for Switzerland. His agency has a central office in Basle, with branches in Lucerne, Berne, Zurich and Geneva.

G. M. Graham has joined the selling forces of the Pierce-Arrow Motor Car Co., Buffalo, N. Y., as assistant commercial manager. He comes to the Pierce-Arrow from the Willys-Overland Co.

Nelson Gotchell has been made sales manager of the Northwest for the Smith Motor Truck Corp. He was formerly with Chandler Motor Car Co.

T. S. Gamble has become a partner in the advertising firm of Benson, Campbell & Slaten, Chicago and Cleveland. He recently severed his connection with the Maxwell Motor Sales Corp.

O. E. Stoll has been made sales manager of the General Motor Truck Co., succeeding W. K. Chillkoot. He was formerly head of the Philadelphia branch of the company.

Gould Allen has joined the sales staff of the Republic Motor Truck Co., Alma, Mich., and will be located on the Pacific Coast. He was formerly sales manager of the Covert Gear Co., Lockport, N. Y.

W. B. Cochrane has been added to the staff of the General Motors Truck Co., Pontiac, Mich., and will be in charge of the Pacific Coast business of the company.

H. W. Curtis has been appointed general manager of the Samson Motor Co., Pittsburgh, Pa., distributer for Maxwell. He was formerly with the Maxwell factory in Detroit.

A. H. Woods has joined the truck sales department of the Van Cortlandt Vehicle Corp. of New York City, distributer of the Peerless cars and trucks. He has been with the American Locomotive Co., Providence, R. I., for the past 5 years.

The TRAFFIC CODE *on The Road to Success*



Mr. TRUCK DRIVER: *You are your own corner cop.*

Don't try racing with a touring car; your truck was built for strength, not speed.

Wash your truck frequently; a dirty-faced delivery car spoils a lot of your employer's printed advertising.

Don't neglect a squeak; noise is a protest against disuse of squirt can and grease gun.

Street car tracks are nice for springs but hard on tires—and steel costs less than rubber.

Don't keep extra spark plugs and other delicate parts in with wrenches and jacks; the hash they make isn't a good truck diet.

Don't neglect a loose part, even though it seems to operate more freely that way.

Don't take it in one load if it should be handled in two; a single straw overload broke the well-known camel's back.

Letting her coast full tilt down this hill only means harder pulling to get her up the next one.

Don't forget to watch the fellow ahead; a slow stop on your part nearly always costs you a punctured radiator.

Use your brakes when getting "spotted;" platforms were built to load from, not for bumping posts.

Don't drive too close to the curb; edge-trimming is a fine institution for pie crusts, but too expensive for truck tires.

The steering wheel is vastly important, but it is well also to give the grease cups an occasional turn.

Don't slide the rear wheels when stopping; rubber pavement polishers are too much of a luxury even for your boss.

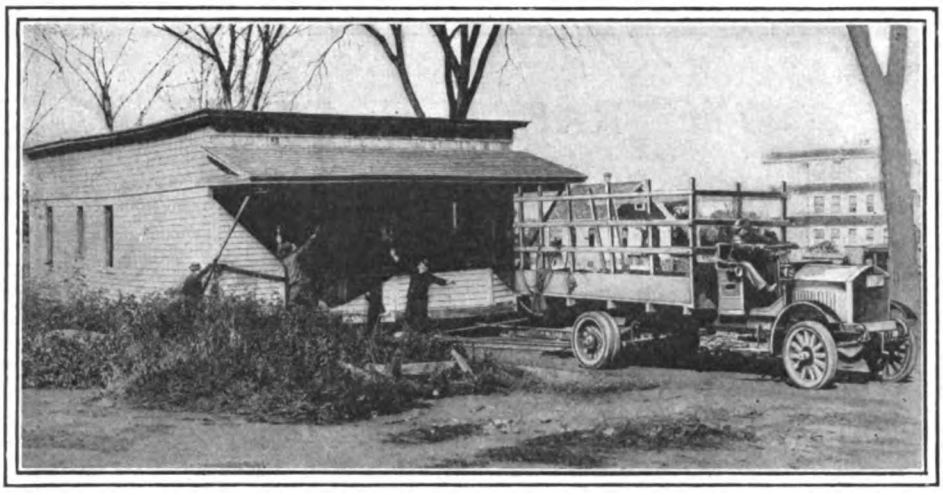
Make haste slowly—especially when going around corners on a slippery pavement.

Don't let the motor idle while you're making a delivery; the radiator won't freeze during a reasonable stop.

ASK THE MAN WHO OWNS ONE

The above traffic code, culled from a recent issue of the Packard Truck Digest, published by the Packard Motor Truck Co., Detroit, is somewhat similar to our Ten Commandments in that, like them, it lays down rules which, if diligently adhered to, should insure a motor truck a long and useful life just as a strict adherence to the writings on the two stones which Moses brought from Mt. Sinai should enable us mortals to run our allotted span of life, a benefit to ourselves and our fellow men. The rules as set forth are so pertinent that it might not be a bad suggestion to mount the code on a piece of cardboard and tack it up in the driver's cab where he would always be reminded of the little things he should do and should not do to protect the long life of the truck which its maker has attempted to build into it

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Another of the unusual tasks to which a motor truck is sometimes put is shown in the above illustration picturing a 3½-ton Selden truck intrusted with the work of moving a five-room, 20-ton house to make room for the new Remington City which has sprung up in Bridgeport, Conn., since that city was turned into one of the world's greatest ammunition centers. The truck is owned by the Coleman & Tracy Co., truckers in Bridgeport, and pulled the house over greased timbers without the least difficulty. The dwelling shown is one of a large number moved in the same manner by the utilization of the drawbar pull of the truck, for Bridgeport's population increased in such leaps and bounds that entire new home settlements had to be erected to house the night and day shifts of workmen employed in the fire arms factories since the war began. This necessitated the removal of many old houses to make room for the new. In 1910, Bridgeport had a population of 102,000. Now she has over 150,000, the greater portion of which has been added since the war began

G. W. Preston and **H. W. Pelton**, of Omaha, Neb., have formed a partnership to handle Federal and Vim trucks.

H. Troutwine has been appointed salesman for Packard trucks by the Fisher Automobile Co., Indianapolis, Ind.

J. A. White has been appointed manager of battery sales of the U. S. Light & Heat Corp., Niagara Falls, N. Y. He was formerly in charge of the Boston and Chicago offices of the company. W. W. Halsey has been appointed manager of the New York sales office.

W. H. Barcus has been placed in charge of the new Cleveland, Ohio, district of the Fisk Rubber Co., which includes Cleveland, Toledo, Lima, Columbus, Youngstown, Dayton, Cincinnati and Pittsburgh. He was manager of the Cleveland territory before its recent expansion.

C. E. Cook has been named director of 120 branches of the B. F. Goodrich Co. He was formerly Pacific Coast manager of the company.

R. B. Pierce has been appointed manager of the Cleveland branch of the Kelly-Springfield Tire Co. He was formerly chief adjuster of the company.

J. D. Lucie, B. C. Layman and **O. S. Johnson** have joined the sales department of the Parker Rust-Proof Co. of America, Detroit. They were formerly with the United States Tire Co.

E. T. McMartin has been made manager of the Fisk Rubber Co. district, which includes Salt Lake City, Butte, Mont., and Bismark, N. D.

H. L. McClaren has been elected president and general manager of the Racine Rubber Co., Racine, Wis. L. T. Vance has been named as vice-president and general factory manager; Stuart Webster is treasurer, and H. C. Severance has been elected secretary and general sales manager.

George G. Weidner has joined the staff of the Benford Mfg. Co., Mt. Vernon, N. Y. He was formerly with the Philadelphia branch of the Stewart-Warner Speedometer Corp.

F. N. G. Kranich has been placed in charge of the engineering department of the Hyatt Roller Bearing Co. This department, located in Chicago, will handle farm applications other than tractors.

W. J. MacInness has joined the service staff of the Mahin Advertising Co., Chicago. He was formerly manager of the Western Advertising Co., of Racine, Wis.

H. H. Huffman, Columbus, Ohio, has taken out a patent on a five-piece jack. He is associated with the Jeffrey Mfg. Co.

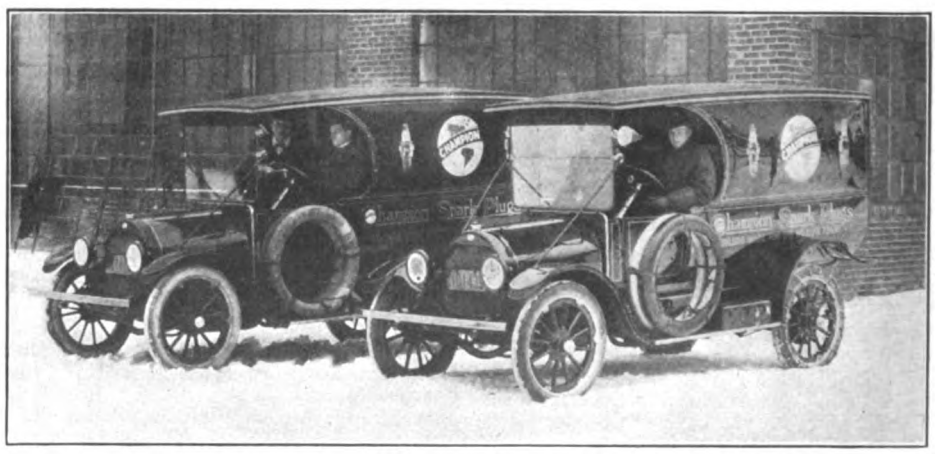
M. R. Korshin has been made eastern district sales manager for the Atterbury Motor Car Co., Buffalo, N. Y. He will have charge of the sales in the eastern half of New York State, and all of Pennsylvania, Maryland and New Jersey, in addition to the New England territory. He was formerly only New England manager for the Atterbury company.

Two new roads in China usable for motor vehicles are now being arranged for. One, about 14 miles in length, is to be from Shanghai to Woosung; the other is from Dairen on the Kwangtung Peninsula to the summer resort at Hoshigaura or Star Beach. China has very few roads suitable for heavy vehicles, and these improvements are expected to increase the good roads movement, thus creating a greater demand for motor cars and trucks.

A Little Giant truck has been sold to the New York Central Railroad for use in its stores department at Collingswood, Ohio. The railroad finds it economical to use motor truck service in this capacity.

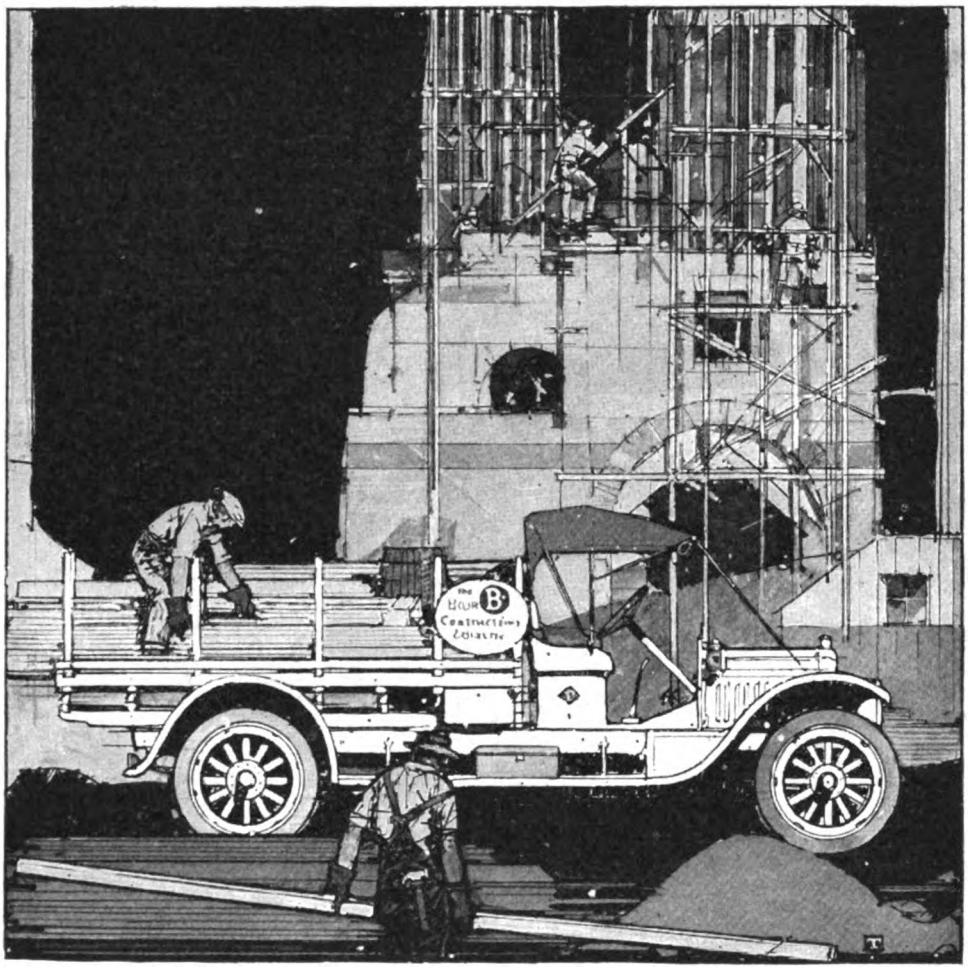
A Chile Truck Agency is desired by a firm in that country which seeks to market a four-wheel-driven truck there. Quotations given to the firm in question should be made f.o.b. New York. Cash will be paid and references given. Correspondence may be in English. Further information regarding the name and address of the concern may be obtained from the Bureau of Foreign & Domestic Commerce, Washington, D. C., or from any of its branches throughout the country. The inquiry is known as Foreign Trade Opportunity No. 23,472, and was published in *Commerce Reports* for Jan. 10, 1917.

Motor Trucks Are Needed in Spain according to a merchant in that country, who desires to represent American manufacturers and exporters of commercial vehicles. Correspondence may be in Spanish or French and references can be furnished. The name of the merchant and further information may be obtained from the Bureau of Foreign & Domestic Commerce, Washington, D. C., or from any of its branches in the large cities throughout this country. In writing refer to Foreign Trade Opportunity No. 23,218.



Overland from Toledo, Ohio, to the Pacific coast, the two Overland delivery cars owned by the Champion Spark Plug Co. and shown above, offered a ready means of exhibiting the company's product at the motor vehicle shows held between Chicago and the coast. The route of the vehicles led through Chicago, Kansas City, Dodge City, Las Vegas, Santa Fe, Magdalena, Flagstaff and Los Angeles. The journey, a trying one under the most favorable circumstances, presented almost insurmountable difficulties at this time of the year due to the poor condition of the roads through the mountains. In addition to a large amount of advertising matter, the two cars carried a complete repair outfit and first-aid paraphernalia to enable them to get through snow drifts and over muddy roads

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WHITE TRUCKS

YEARS of adjustment, refinement and correction in the design and construction of motor trucks has given The White Company a practical knowledge of this work which cannot be gained in any other way. The result shows in the test of actual service. Under the racking strain of continuous year-around demands, the White Truck stands up to its work with fewer days off for repairs than any other make of truck of which we have record.

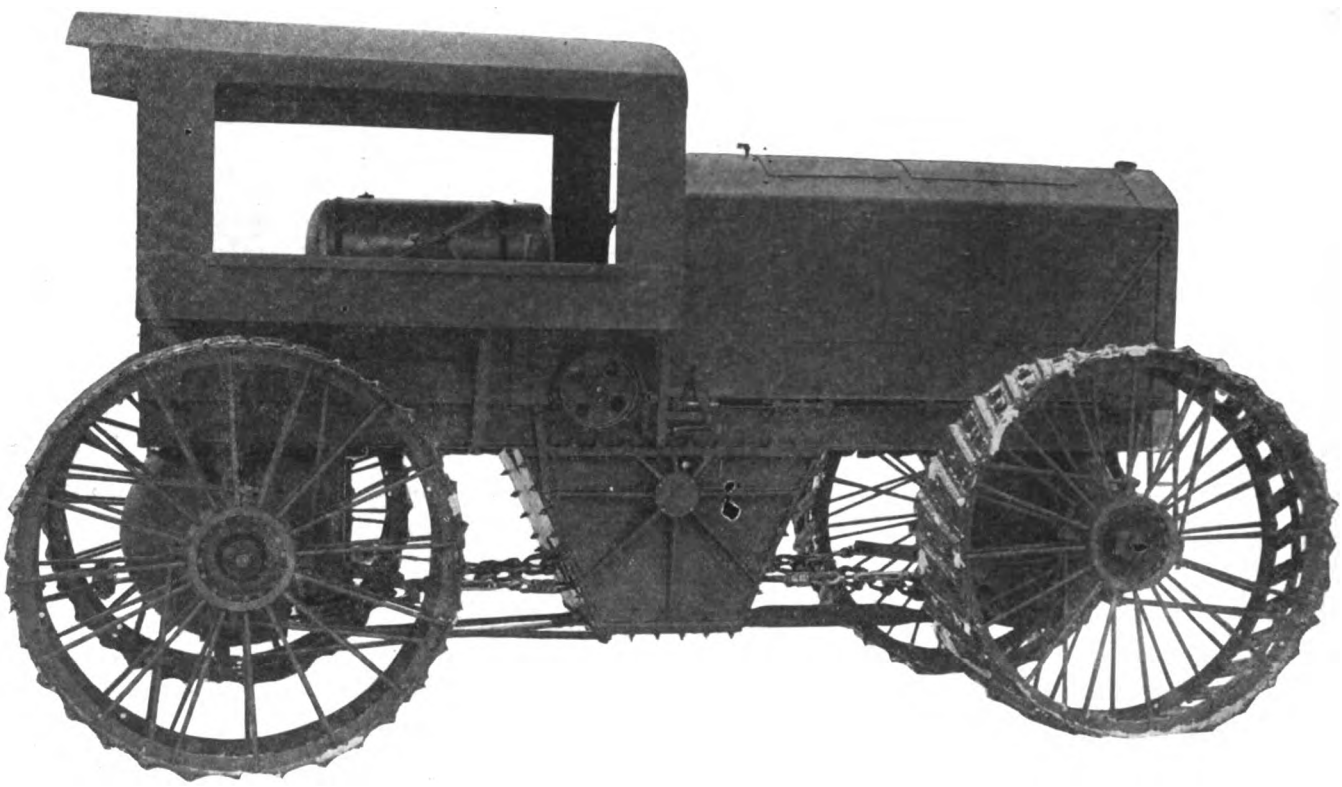
The broad experience behind White Construction has been supported by the largest motor truck output of any manufacturer in America; it covers every type of truck used.

THE WHITE COMPANY

CLEVELAND

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Lenox "American" Tractor



SPECIAL ADVANTAGES

4-wheel drive, 4-wheel steer, light weight, extreme flexibility and unusual amount of horsepower actually delivered at the drawbar.

Splendid territory open for live dealers.

Catalogue and prices on request.

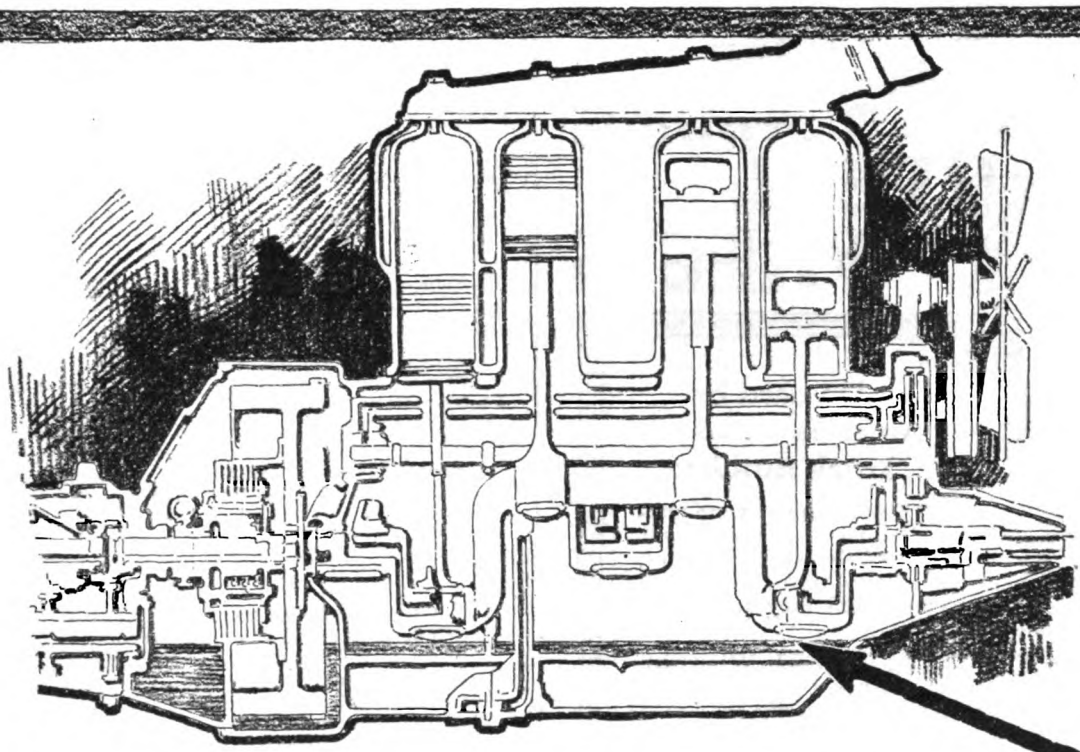
While we do not exhibit at the Boston Show, our showrooms on Boylston St. are very convenient to both the show and the principal hotels.

Manufactured by

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889 Boylston St. **BOSTON, MASS.**

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The Proper oil at the proper level

TEXACO MOTOR OIL

You can tell it by its clear, clean color.

YOU have seen cars trailing clouds of black, dirty smoke behind them. That smoke, as you know, is caused by too much oil.

Such a condition is wasteful and destructive. It is destructive because no matter how good the oil is, if fed rapidly, it will work past the piston rings, and because of the excess oil, only partial combustion is possible and carbon deposits will ensue.

Some oils will deposit hard, gritty matter. This clogs up the motor, sticks to the spark plug, causes missing and back-firing, and scores the piston rings and cylinder walls.

However, there are several oils which will not deposit hard carbon. With these the products of incomplete combustion are soft, fluffy and non-adhesive. They are blown off with the exhaust.

Such an oil is Texaco Motor Oil. Use it properly, keep it at the proper level in your crank case—inspect the indicator and be sure that it is in good order—and you will find it the proper oil to use under all conditions.

There are reasons—Texaco Motor Oil, on account of its basic qualities, cannot deposit a hard carbon crust. When too much Texaco Motor Oil is fed, the worst it can do is to form a soft soot which will not scratch or cut and which may be easily wiped off.

Texaco Motor Oil lubricates perfectly, keeping friction at a minimum. It gives a perfect seal between piston and cylinder walls thus preventing leakage of gasoline into the crank case. It maintains its original body and quality in use.

Texaco Motor Oil may be obtained at most good garages. The safest way, the best way, to buy is in one or five gallon cans.

THE TEXAS COMPANY
New York Chicago Houston
DISTRIBUTING OFFICES IN MOST CITIES

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WEST'S CAST-STEEL WHEELS for MOTOR TRUCKS



"Patent Pending"

Are used by America's leading Truck Builders

These wheels were designed by, and are built under the supervision of, experienced engineers. They have been thoroughly tested and have proved they will stand hard usage and abuse.

Over 25,000 WEST'S CAST-STEEL WHEELS are now used on trucks and not one of them has failed to give satisfaction. Specify WEST'S CAST-STEEL WHEELS on every heavy truck you buy.

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ARE BUILT FOR STRAINS



We have recently completed another large addition to our factory in order to be of service to our customers and are now in position to make prompt deliveries on most sizes of roller chains.

Whitney Chains are strong, accurate and dependable. They are used by the leading makers of trucks throughout the country.

Insist on "Whitney" Chains when making replacements.

The Whitney Mfg. Co.

Hartford, Conn.

Chains, Keys and Milling Machines

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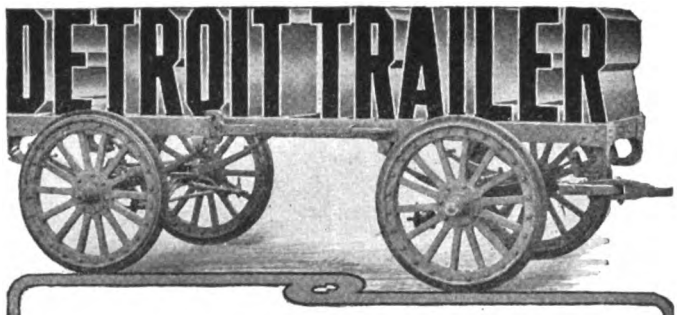
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1½-3-5 and 7 Ton Sizes

DOUBLE end steering device of original design makes it not only possible but EASY to back trailer anywhere. Double swiveled tongue; no other trailer has it.

Also pole, semi, and pleasure car trailers.

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3-part construction. Will not leak. Install them on one truck, and you will want them on your entire fleet. *Write.*

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in stock and to order.





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New Catalog.

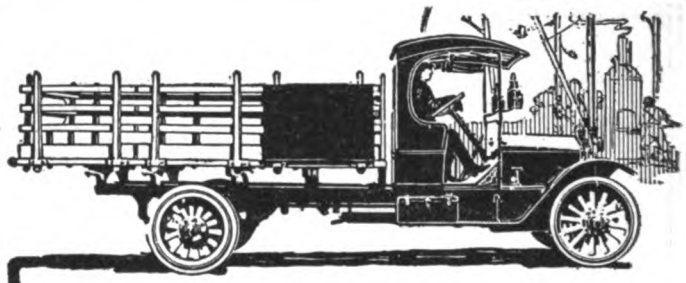
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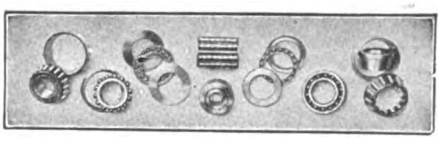
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Uninterrupted Raceways
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CLEVELAND, OHIO

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Counterbalanced
(Patent Applied for)



We have shipped
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Shafts up to February 26, 1917

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CLEVELAND

Strong—Sturdy—Wonderful

METZ

HIGH-DUTY ONE TON TRUCK

$695

METZ COMPANY
WALTHAM, MASS. U. S. A.

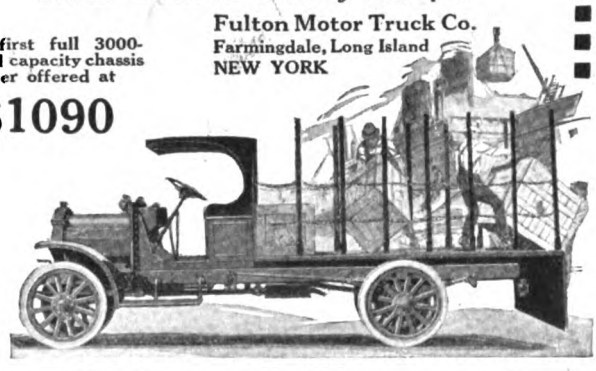
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Dealers—*Write for territory still open*

The first full 3000-pound capacity chassis ever offered at

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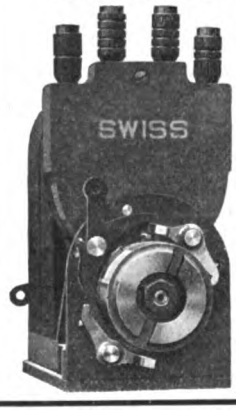
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America's Finest Magneto



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Both at home and abroad, that is the opinion of those who know. Everywhere the Swiss is the choice of manufacturers of cars, trucks and tractors, who would rather pay a little more and have their ignition *right*, than risk their reputation with cheap, uncertain ignition.

The Swiss Safety Starting Coupling Absolutely Prevents Back-Kicks from Pre-ignition. It is the only coupling with which the impulse spring cannot interfere in the proper action of the magneto.

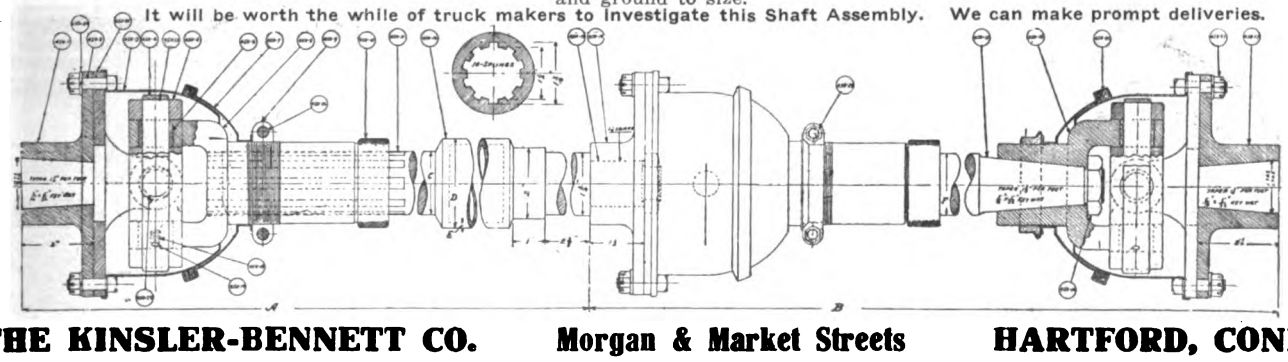
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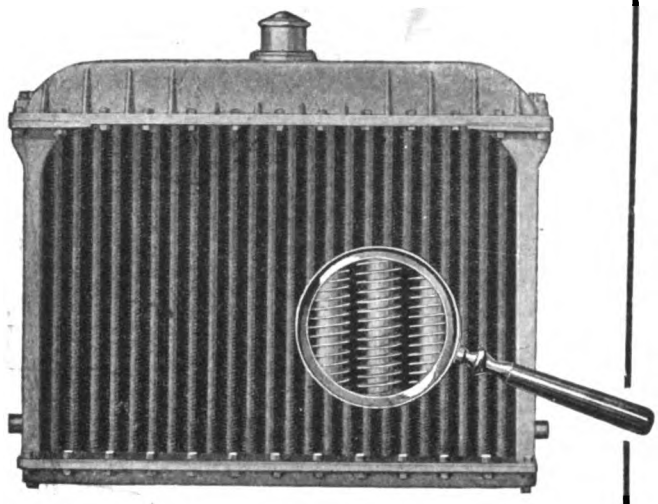
It will be worth the while of truck makers to investigate this Shaft Assembly. We can make prompt deliveries.



THE KINSLER-BENNETT CO. Morgan & Market Streets HARTFORD, CONN.

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Seamless Copper Helical Tube Cooling Sections

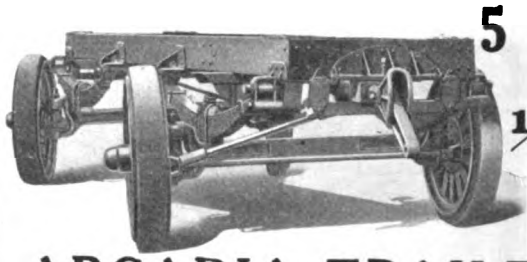


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Dealers: Get Open Territory Now
Write for Proposition
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The Two Ton Worm Drive

YEARS AHEAD

Dealers—write for specifications and open territory

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Our reputation for producing the most lasting truck is recognized by our many users.

We offer for your convenience the following sizes:

1½ ton 3½ ton
2 " 5 "
7 ton

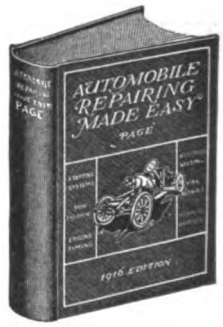
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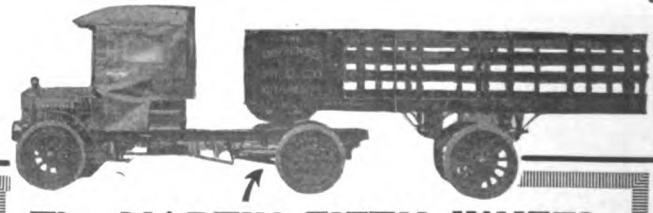


Fedders Radiators

Fedders quality is largely the result of 18 years' specializing in radiator production.

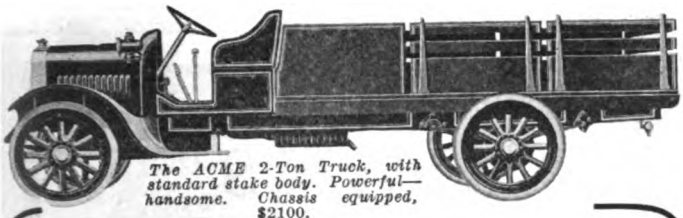
Fedders Manufacturing Co.
Buffalo New York

One-Ton with Three-Ton Efficiency



The MARTIN FIFTH WHEEL
makes possible this combination of a 1-ton Packard and a 3-ton Fruehauf trailer.
Write for further information
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SPRINGFIELD, MASS.

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The ACME 2-Ton Truck, with standard stake body. Powerful—handsome. Chassis equipped, $2100.

Fill Immediate ACME Orders!

DEALERS: Get the quick, profitable business of local truck buyers who know the advantages of ACME Trucks and want them for early delivery. The surest selling features to meet customers' requirements for from 1-ton to 3-ton capacities.

Clinch the ACME Agency now—and sell easily, with substantial profit. No large service to render because of fifteen famous "Proved Units" from radiator to tail light. ACMES have oversize dimensions. The 2-ton ACME has powerful 40 H. P. Continental Motor and big capacity—Chassis, equipped $2100.

ACME THE TRUCK OF PROVED UNITS

Be in a position to accept big business on our One-Ton Truck. Announcement and specifications sent on request. An all-feature worm drive ACME —$1500.

Write for Booklet, "A Business Builder," and Territorial offer today. Or WIRE—

Cadillac Auto Truck Co.
12 Mitchell Street
CADILLAC, MICHIGAN

Veeder Hub Odometer

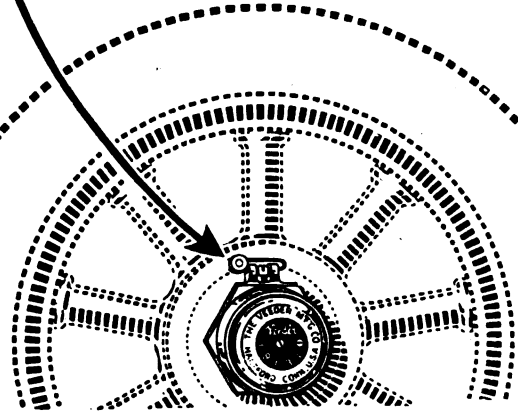
—the positive mileage recorder. It registers the distance traveled backward as well as forward. This prevents any one from subtracting mileage by running the wheel backward. It is arranged to be sealed on the hub in place of the regular hub cap and cannot be taken off without the owner's knowledge. There is no way to disconnect it by slipping gears out of mesh. It is sturdy—yet absolutely accurate.

This makes it practically a necessity on pleasure cars and indispensable for trucks and taxicabs. Price $20. Special model for Ford Cars $15.

Cyclometers, Odometers, Tachometers, and all kinds of Counters. Fine Die Castings.

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New York Representative—Joseph T. Quinlan, 1777 Broadway



Garford

MOTOR TRUCKS

Garford Trucks range from one ton to six tons in capacity.

They are designed and built by men who have spent their lives in the study of motor trucks.

They are backed by one of the strongest organizations in the industry.

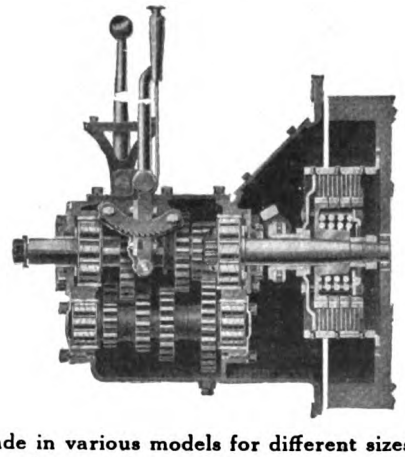
Bodies are provided to meet all requirements.

Write for catalog. Please address Dept. 103

The Garford Motor Truck Co., Lima, O.

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TRANSMISSIONS



Made in various models for different sizes and types of cars—Covert Transmissions will free you from transmission troubles. Let us show you how they fit your construction.

Covert Gear Company, Inc.

Sales Office, Detroit, Mich.

Factory, Lockport, N. Y.

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AGENTS WANTED



"Little Giant" in the service of the
Inland Steel Company

Owing to territorial adjustments we now have several money making territories open to live agents. If you want to connect with a progressive motor truck manufacturer who backs his guarantee with $12,000,000.00 capital, who has had twenty-five years manufacturing experience and who has 25,000 satisfied customers in the United States

Here is Your Opportunity.

The *"Little Giant"* Line Includes

Little Giant Convert-a-Car.
(Converts any Ford into a one ton truck)
Model 15—1 Ton Worm Drive
Model 16—2 Ton Worm Drive
Model 17—3½ Ton Worm Drive

SPECIAL BODIES FOR EVERY PURPOSE

Write for Prices, Specifications and Terms

CHICAGO PNEUMATIC TOOL CO.
615 Little Giant Building CHICAGO
Branches and Service Stations Everywhere



"EVANS"
UNIVERSAL JOINTS
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consist essentially of two hardened trunnion blocks of large area running in spherical slots which also act as a bushing for the right angle hinge motion.

Compact—Durable—Powerful

Simply constructed with a minimum number of parts and completely encased within a dust proof housing which holds grease to lubricate the working parts.

Angle of drive up to 15 degrees.

"Hele-Shaw" Clutches "M. & E." Grease Cups

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Wheeling
Chicago
St. Louis
Kansas City



THE KREBS COMMERCIAL CAR CO. CLYDE, OHIO U.S.A.

Real Value

You get the full value of your money and more when you invest in a KREBS Truck.

Guaranteed by manufacturers with 16 years' experience in motor vehicle construction, the KREBS combines Simplicity and Low Maintenance with Efficiency and Reliability.

It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault-type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

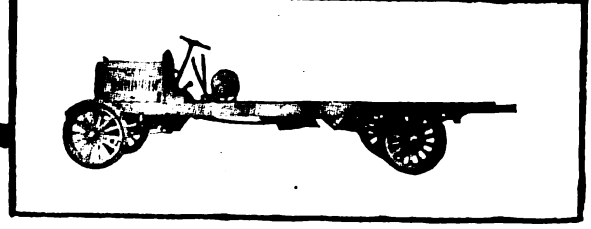
Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.

KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.

Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.





Truck Tire Efficiency

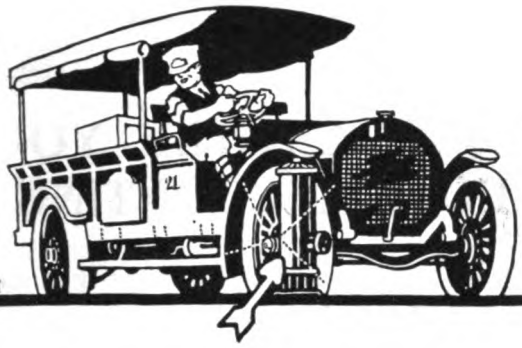
Our new, secret process compound, vulcanized under a pressure of 1,600,000 pounds (almost four times the pressure used to vulcanize ordinary truck tires) has more vitality, rugged strength and durability than any other compound manufactured.

For this reason, United States Solid Truck Tires are the strongest and most durable now on the market.

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TRADE **DREADNAUGHT** *Indestructible* **Hub Odometer** MARK

Heavy cast housing gives it perfect protection. We'll give you a new one free if you break it. It's always working—uncovering delivery leaks every day—enabling you to stop them.

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Manufacturers of Jones and Popp Taximeters

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REFINED AIR FURNACE

CASTINGS

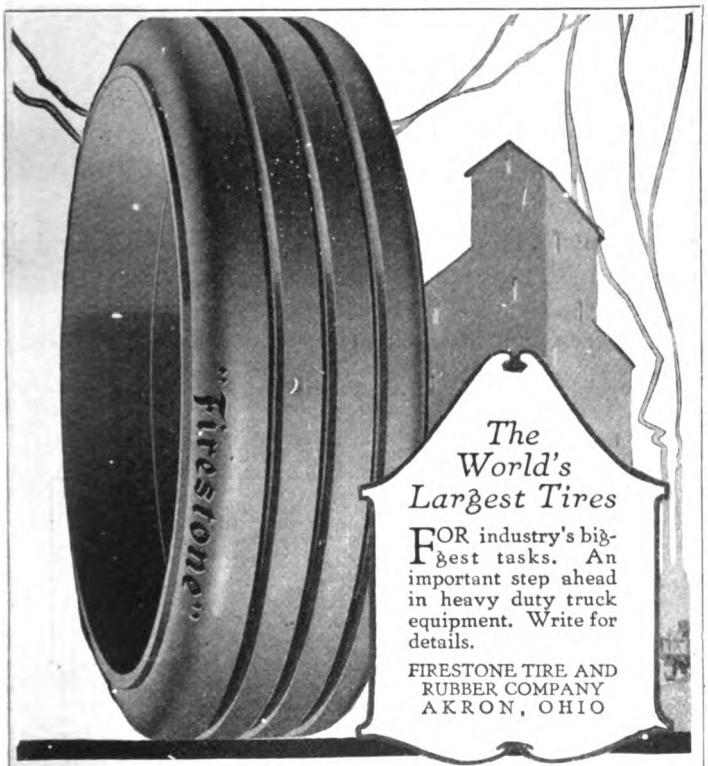
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Automobile Truck Tractor and Trailer Parts

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1882

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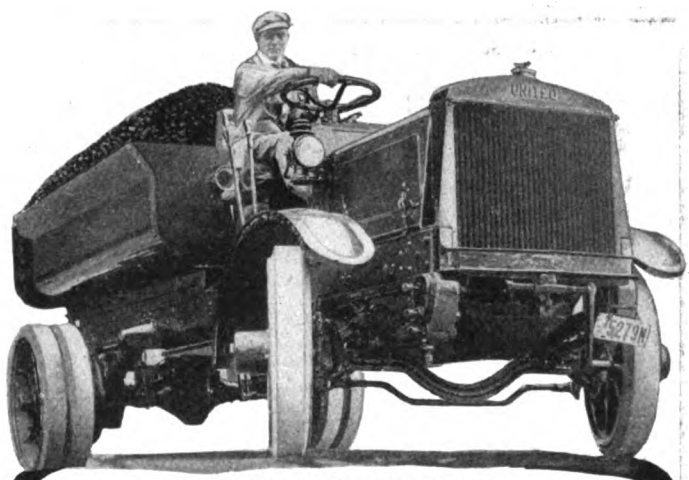
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FOR industry's biggest tasks. An important step ahead in heavy duty truck equipment. Write for details.

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GIANT TRUCK TIRES



BEST FOR HEAVY DUTY

Dealers who are awake to the possibilities in the motor truck field are today pushing a line of heavy-duty trucks. United Trucks are designed essentially for heavy-duty service. They have the strength, power and endurance for the hardest kind of work. On account of their superior performance, dealers find United Trucks easy to sell —and they STAY SOLD. Made in 2, 3½, 4 and 5-ton sizes, all worm drive. Get our inreresting dealers' proposition.

UNITED MOTORS CO.,
672 North St., Grand Rapids, Mich.

United Trucks

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MONARCH

Limits the Speed and the Expense

Motor trucks—regardless of size, weight, capacity, price or make—are not built for speed. Their comparative speed, of course, is greater than that of the horse-drawn vehicle; however, the greatest ultimate efficiency is the result of continuous service.

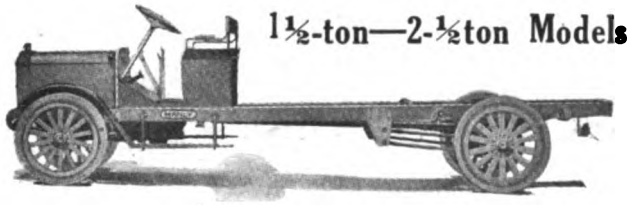
The greatest foe of ideal truck service is vibration. It shortens the life of every part of the truck—it increases the cost of repairs and deprives the owner of the continuous use of his truck. Vibration multiplies with the increased rate of speed traveled.

Speed, therefore, is the greatest enemy to truck efficiency.

The Monarch Governor limits the speed without limiting the power. It's the only Governor designed solely for internal combustion engines. See it—try it—prove its adaptability on your own truck by a 30-day trial.



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Detroit, Michigan



1½-ton—2-½ton Models

America's New Quality Truck Has 20 Remarkable Features—

features proven in the fire-test of actual service to be of money-saving merit to users and sales creative value to dealers. These set MANLY Trucks in a class far up among quality commercial vehicles.

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Wire or write for advance information or visit our factory. Handsomely illustrated catalog sent on postal request.

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Get the Most Complete set of records possible, including a performance record as well as an account of expenses.

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Dependability Plus Service

We want a Dealer with energy and spirit,—we want one who will make the co-operation with him of our factory organization worth our while, and his. We want men who can interest concerns in our heavy-duty trucks and then not let up until they sell them.

If you are such a Dealer we have an interesting selling proposition that will interest you immensely.

Besides the WICHITA 3½-ton capacity truck, we have a 2½-ton and a 5-ton truck—both worm driven.

Write us for our plans.

WICHITA FALLS MOTOR COMPANY
Arthur Boulevard, Wichita Falls, Texas

NEVER-LEAK
Copper Asbestos-Filled
GASKETS

Get your estimate on your next gasket requirements. You will be agreeably surprised.

For producing absolutely gas-tight joints nothing has ever been invented to compare with Never-Leak Gaskets. You can protect yourself from all worries over compression leaks if you fully equip your motor with these Copper Asbestos-Filled Gaskets.

The copper gives malleable metal contact surfaces. The asbestos secures a body which retains a powerful spring under compression.

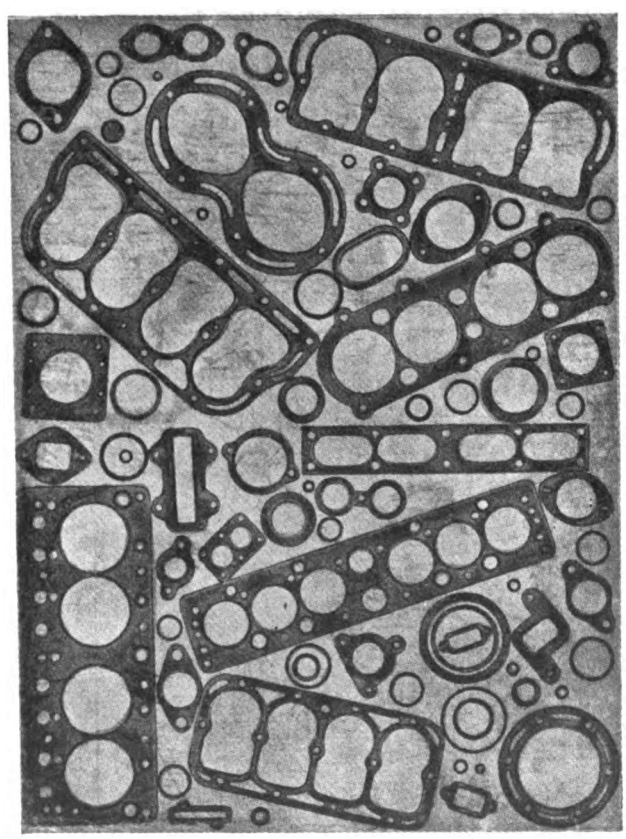
If you have gasket trouble of any nature consult our Engineering Force. This will involve you in no obligation or expense.

Write for our estimates. We are equipped with many thousand special dies such as here shown and can readily produce the gaskets you need.

Have "Never-Leak" on every gasket.

The Fitzgerald Mfg. Co.
TORRINGTON, CONN.

Gasket Dept.



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DENBY
TRUCKS
FOR TRAIL OR PAVEMENT

EVERY one knows the remarkable strides in public favor which the internal-gear axle for motor-trucks has made in the last few years.

Denby pioneered the internal-gear drive—we have never built any other type of truck. And the public estimate of the internal-gear is largely based on Denby performance.

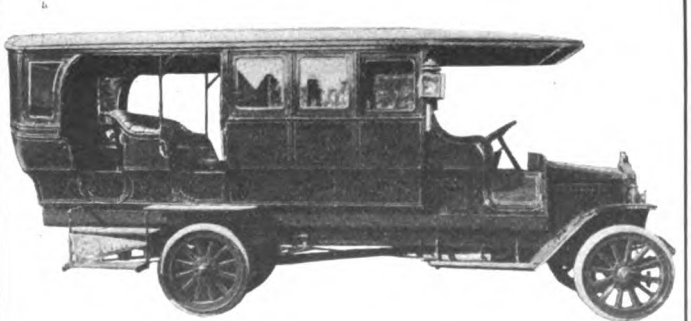
The dealer who is handling Denby trucks finds Denby prestige his greatest sales-asset. The buyer knows the truck itself—there merely remains the matter of fitting it to his business.

And in doing this, Denby cooperation is exceptionally thorough.

Write us about your territory.

Denby Motor Truck Company

Dept. K, Detroit, Michigan



Standard

MADE IN DETROIT USA

Motor Trucks

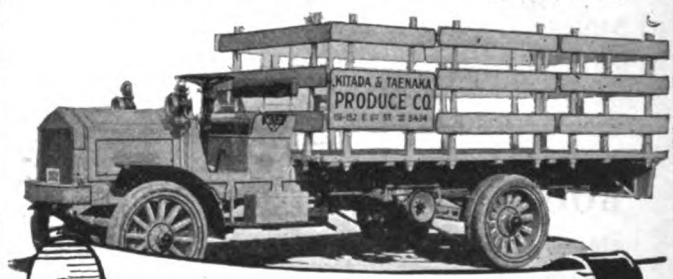
Startled the Motor Truck Industry By a Unique Sales Plan

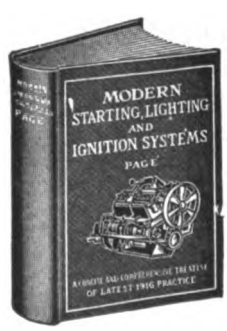
First of all, the Standard is an unusual truck. It is a powerful combination of many of the world's best-known units—the Continental Motor; Timken Axles; Timken Bearings; Brown-Lipe Gears, and other well-known standard parts.

The Standard Motor Truck is sold in an unusual way. Any responsible person can be the agent for the Standard, with absolutely *no investment—no deposit* and *no contract.*

Write for details of this plan. No obligation.

STANDARD MOTOR TRUCK CO., 315-327 Bellevue Ave. Detroit, Mich.





MODERN STARTING, LIGHTING AND IGNITION SYSTEMS

By Victor W. Pagé, M.E.

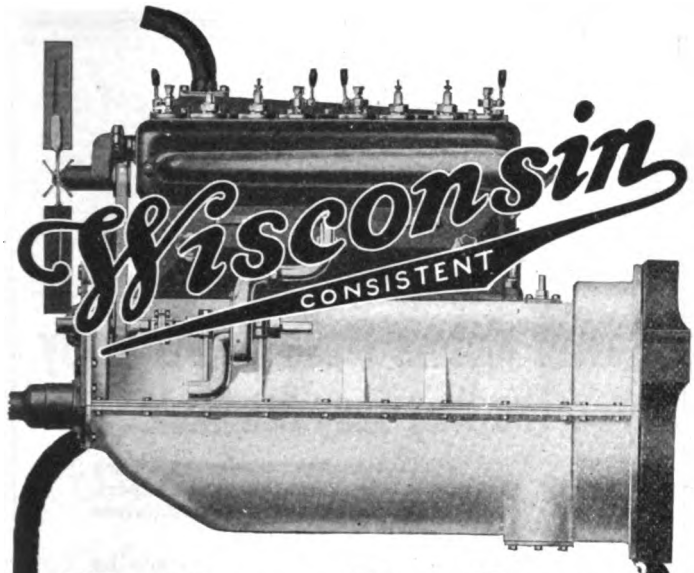
250 Specially Made Engravings. Nearly 400 (5½ x 8) Pages. Folding Plates.

A Self-Educator on Electrical Systems. All the leading systems of Starting, Lighting and Ignition have been described and illustrated with the cooperation of the experts employed by the manufacturers. Wiring diagrams are shown in both technical and non-technical forms. All symbols are fully explained. This is a book of real merit.

Commercial Vehicle

241 W. 39th St., New York

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The More a Man Knows

about motors the higher is his opinion of the Wisconsin. In design, in materials, in workmanship, Wisconsin Consistent Motors are unexcelled. Our attention is fixed on keeping the quality up, not on speeding production up.

Write for specifications of motors for pleasure cars, trucks or tractors.

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Sta. A. Dept. 319 Milwaukee, Wis.

New York Branch: 50 Church St.
T. M. Fennerm, Factory Representative.

Pacific Coast Distributor: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles St., Los Angeles, Cal.

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TRUCKS

Diamond T Service is as thoroughly built into our ¾-ton trucks, the smallest of the line, as it is in our 3½ ton model.

Its low cost is made possible only by its wide popularity which has enabled us to produce this model in enormous quantities. There has been no cheapening of quality or inferior workmanship permitted in its design or construction.

For a thousand uses it is the most satisfactory and economical delivery vehicle ever marketed. With a body suited to your requirements, it will improve your delivery service while lessening your operation expense.

Write to-day for catalog.

Diamond T Motor Car Co., Chicago, Ill.



Heavy Duty Truck Frames

Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

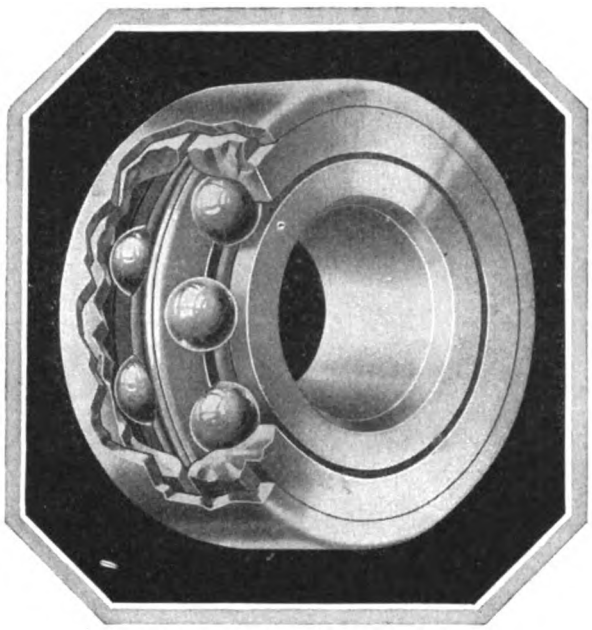
Added capacities together with latest type equipment enables our assuring you of satisfactory service.

Our engineers are at your service, and we solicit your inquiries.

DRIGGS-SEABURY ORDNANCE COMPANY

SHARON, PENNA.

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A SUCCESS—
thanks to QUALITY

New Departure Ball Bearings have made good in the face of the severest competition with both foreign and American makes.

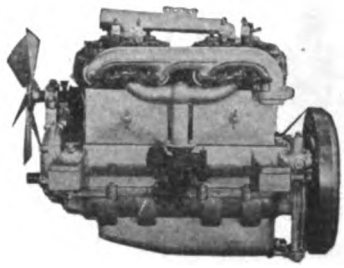
This success has been due in the main to *quality*—proper steels, accuracy and endurance in-built.

That is why New Departure Ball Bearings dominate—are in 80% of American car models—*cars of every price class.*

Whether owner, dealer or manufacturer you should know what New Departure Ball Bearings mean to the automobile. Write for the "Brown Book."

THE NEW DEPARTURE MFG. CO.
BRISTOL, CONN. DETROIT, MICH.

NEW DEPARTURE BALL BEARINGS



Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

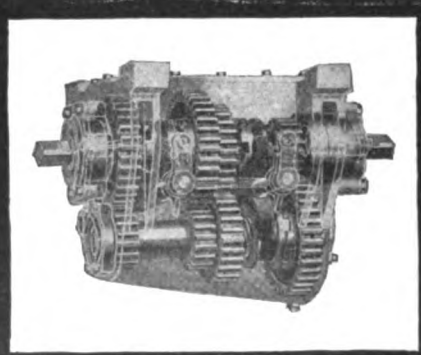
BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications.

BEAVER MFG. COMPANY
Milwaukee Wisconsin

COTTA TRANSMISSIONS



All Gears Always in Mesh

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

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transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

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Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C.

NORTH AMERICAN MOTORS

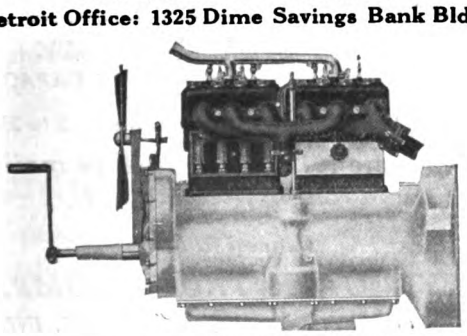
This is to announce two new models which have been added to the "N. A." line. They are: Model C, developing 20-25 H.P., and Model CX, developing 25-30 H.P.

These motors round out a line of power plants for commercial vehicles which are the most thoroughly accessible and simplest truck motors ever designed.

Full information on these new models or on our entire line will be gladly sent.

A Detroit office has been opened at 1325 Dime Savings Bank Building.

NORTH AMERICAN MOTORS COMPANY
Factory: POTTSTOWN, PA.
Detroit Office: 1325 Dime Savings Bank Bldg.





Our Own Trucks Surprise Us

Some INTERNATIONAL Registrations

The **International Motor Truck** leads all other trucks in operation in Ohio, Wisconsin, Michigan, Tennessee and Oklahoma, and in the cities of Chicago and St. Louis. In Michigan, for instance, the home of the motor truck, the **International** leads with 324 trucks, as compared with 259 for the nearest competitor. Further than in these states and cities, the registration has not appeared. These are new figures, sent out by the separate states, and they show **International** popularity that surprises even us.

No more compelling argument than these facts and the successful operation of these thousands of trucks could be cited. The big factor in the huge and rapidly growing sales of **International** trucks is the record of increased profits, reduced hauling costs and economical operation of **Internationals** in daily service in every line of business having loads to haul. Consider these

New Low-Price INTERNATIONALS

Model H—1500 lbs. capacity, internal gear drive (chassis)..... $1225

Model F—2000 lbs. capacity, internal gear drive (chassis)..... $1500

Prices cash f.o.b. factory.

Eighty-nine company branches and thousands of local distributors cater to the needs of **International** owners. Up-to-the-minute service is always at your hand. Write to the address below for attractive folders with all the details and full information. You owe it to the prosperity of your future to know more about the **International** motor trucks. **Now** is the best time to write.

International Harvester Company of America

(Incorporated)

88 Harvester Building Chicago U S A

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AUTOCARS

are equipped with the

"JASCO" TANK

Why? Because demonstrated service facts have proven that this gasoline receptacle makes fuel absolutely safe from fire or explosion and devotes every drop to energy.



"JASCO" TANKS are made of drawn steel. They are seamless, tinned and tested and positively cannot spring a leak even under the most severe conditions. They are money savers, life and property protectors. If your car is equipped with an old fashioned riveted tank you are courting danger. Investigate the "JASCO" today. Full details on request.

The "Jasco" Tank is used and indorsed by the following prominent manufacturers:

PLEASURE CARS

Biddle Motor Car Company, Simplex Automobile Company, Mercer Automobile Company, Lozier Motor Company, Stanley Motor Cariage Company, James Cunningham Son & Company, H. H. Franklin Mfg. Company.

TRUCKS

Baldwin Locomotive Works, Autocar Company, General Vehicle Company, H. G. Burford Company, Peerless Motor Car Company, Garford Motor Truck Company, Gramm Motor Truck Company, Thomas Auto Truck Company, Motor Trucks, Ltd., Canada.

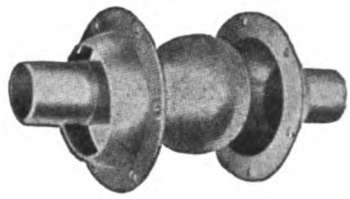
JANNEY, STEINMETZ & CO.

Main Office: PHILADELPHIA

New York Office: HUDSON TERMINAL BUILDING

BOSSERT

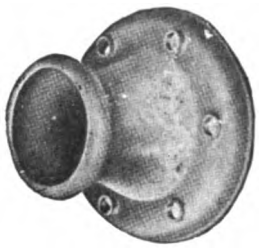
In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice.



We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



The Bossert Co.

UTICA

N. Y.

The

Gary Motor Truck Company

Manufacturers of

Gary Worm Drive

MOTOR TRUCKS



5 MODELS ***5 CAPACITIES***

¾ Ton 1 Ton 1½ Ton 2 Ton 3 to 3½ Ton

Complete 1917 Catalog will be mailed Promptly on Request

General Offices:

GARY MOTOR TRUCK COMPANY

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Half-Ton Light Delivery Trucks Are Most Economical

The lowest cost of operation per ton-mile insures the greatest returns per dollar invested, from any motor truck.

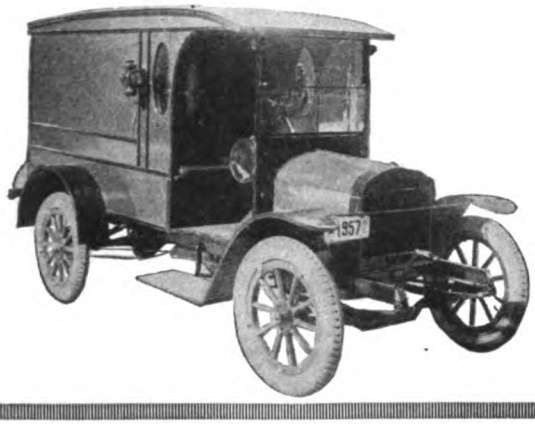
The CORLISS is the most economical truck in its price class. Carefully constructed with parts you know, including Le Roi Motor, Schebler Carburetor, Dixie Magneto, etc.

Write for catalog with complete specifications and illustrations.

Panel Body $695

CORLISS MOTOR TRUCK CO.
Corliss, Wisconsin

Express Body $675



Handle Your Time Sales on the

Guaranty Time Payment Plan



Guaranty Securities Corporation

Equitable Building, New York City

San Francisco
Hobart Building

Montreal
National Trust Company

THE MARK OF A BETTER RADIATOR

G & O Radiators

for

Heavy Duty Service

The G & O Mfg. Co.
New Haven Connecticut

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DUPLEX
THE ORIGINAL
4 WHEEL DRIVE

Do you want a heavy hauler that will climb an icy embankment, or pull through sand and mud up to the axles, with a 3½-ton load.

Do you want a heavy duty truck that will go and keep going where no rear-drive truck can follow? That can't be stuck as long as any one of its four wheels can find traction? That will haul two or more trailers?

Send for your copy of the new 1917 Duplex catalog. It tells why the Duplex meets your requirements. It explains in detail why the even Duplex application of power to all four wheels keeps down the fuel consumption, saves tires, and cuts repair bills to the minimum.

$1,000,000 was raised in 48 hours recently to build new plants to make more Duplexes to answer the demand from contractors, oil men, the U. S. government, mining, construction, and engineering companies. Our production has been tripled in the last two months; and will be doubled again upon the completion of new plants.

DUPLEX TRUCK COMPANY
LANSING MICHIGAN



Duplex hauling its own load and trailers on snowbound wagon trail over badly cut sand loam near Denver, at altitude of 5,000 feet

STEGEMAN 6 SIX CYLINDER TRUCKS

For Heavy Duty Service

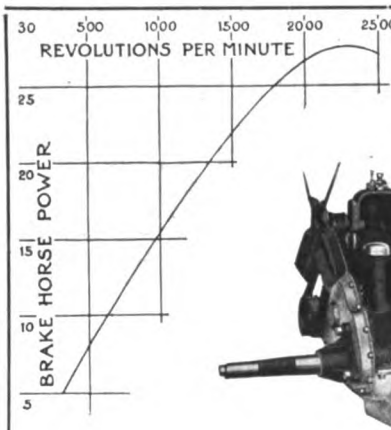
The Stegeman has stood the severest strain and stress of heavy duty service. McDonald of Red Rock, Arizona, hauling ore and freight, says: "I have grades averaging 25% and travel 100 miles each day over rough roads and get 5½ miles to each gallon of gas—hauling both ways."

Agents Beat Competition

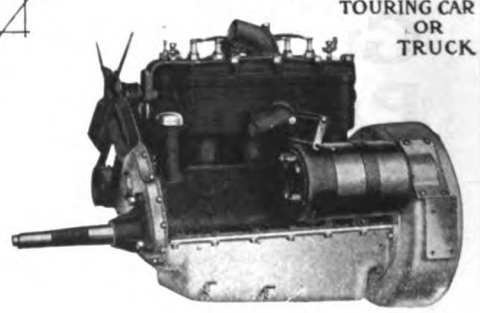
The Stegeman Six has lots of selling proof and evidence. It's the truck with which you can beat competition, because it possesses features buyers want—and other dealers can't supply. Write for vacant territory.



Stegeman Motor Car Co. Milwaukee



LE ROI MOTOR
3⅛ × 4½ MODEL C
FOR THE LIGHT ROADSTER TOURING CAR OR TRUCK



Used by leading manufacturers of best-known American-made light trucks.

The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

CABLE LE ROI MILWAUKEE

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Thermoid
HYDRAULIC COMPRESSED Brake Lining—100%

An Overturned Truck

reflects discredit on both owner and maker. However the accident may have happened, many people say: "Careless driver," or "Irresponsible owner," or "Unreliable maker."

Thermoid Brake Lining won't prevent all kinds of accidents, but it most positively will prevent all those that come from slipping brakes—brakes that fail through their lining. Here is a big source of costly accidents eliminated at trifling expense.

Thermoid will grip with friction power even when worn thin as paper. It is one single solid mass, made so by hydraulic compression. By weight it shows 50% more material than any other brake lining. That material is long-fibre Canadian asbestos spun on brass wire and impregnated with a friction compound which is also impervious to heat, water, oil, gasoline or dirt.



Cannot be burned out nor affected by oil, heat, water gasoline, dirt.

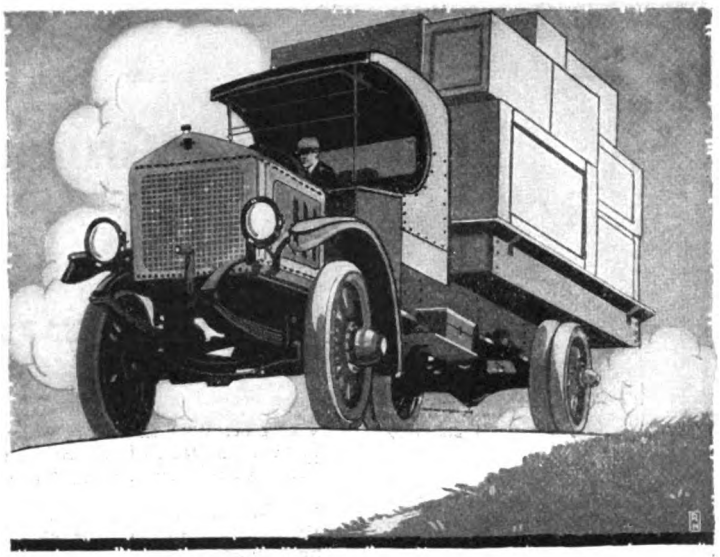
Your Guarantee

Thermoid Brake Lining is absolutely guaranteed to give more satisfactory results and to outwear any other lining manufactured. Not affected by heat, oil, water, gasoline or dirt.

Thermoid Rubber Company

Trenton, New Jersey

Makers of a full line of automobile accessories and mechanical rubber goods.



Lifting Power That Levels Hills

Power at low speed—power enough and to spare—that's what counts in a heavy truck. When the motor turns slowly, the compression is maximum, the mixture often too dense for an ordinary spark to penetrate.

The

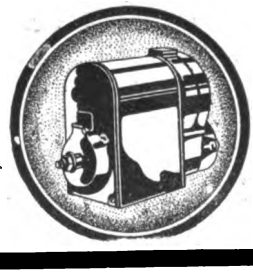
EISEMANN MAGNETO

is standard equipment on 72 different makes of trucks, largely because the manufacturers' tests have shown that the intensely hot, powerful Eisemann spark penetrates the densest compression even when the motor is barely turning over!

In all, 117 manufacturers have adopted the Eisemann Magneto as standard equipment. They know its dependability, its durability, its power!

THE EISEMANN MAGNETO CO.

Sales and General Offices:
32-33rd St., Brooklyn, N. Y.
Detroit, Mich., 802 Woodward Ave.





Don't Wait

until the streets are covered with ice and snow, before getting "NEVER-SKIDS" for your motor trucks.

THE NEW TYPE

NEVER-SKID

practically eliminates vibration

Does away with skidding and affords positive traction on slippery streets. The cross-pieces are made of the finest quality woven steel wire — **strong** enough for the heaviest machines made.

The device can be applied in a few minutes without jacking up the truck, and there is no danger of its catching in driving chains or damaging tires.

YOU WILL SURELY NEED "NEVER-SKIDS" this winter.
Why not get them now?
Folder and prices will be gladly sent

NEVER-SKID MFG. CO.

122 Liberty Street, New York, N. Y.
New England Distributor: WILLARD B. DAVIS, 39 Danforth Street, Fall River
Chicago Distributor: FRED ALLEN AUTO SUPPLY CO., 1610 S. Michigan Avenue

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Announcing

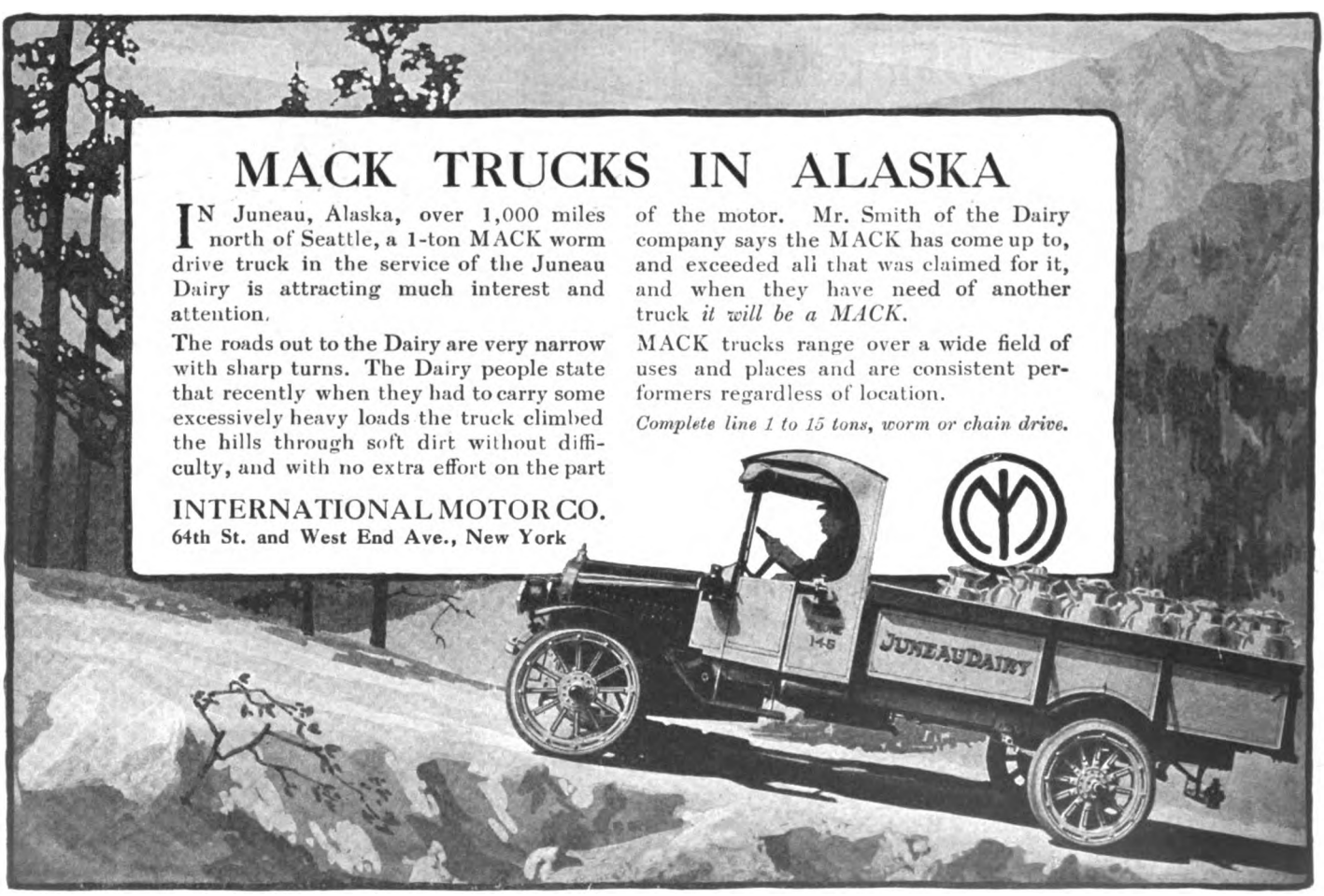
INDIAN TIRES

for TRUCKS

The Guarantee	**The guarantee that accompanies an Indian Tire of course covers as great a distance as that of any other tire made. But we do not expect to sell Indian Tires merely on the big mileage shown in the guarantee.**
The Big Mileage	**The big mileage is built into the Indian Tire by men who have proved their ability by building, for others, some of the farthest traveling heavy duty tires made.**
Long Experience	**Long experience, with leading makers of truck tires, has equipped the designers and builders of the Indian Tire with the knowledge and skill necessary for building tires of the highest possible character.**
Extremely High Quality	**The extremely high quality of the Indian Tire will soon be a matter of common knowledge. It is of a character to command attention—to win respect and confidence.**

INDIAN TIRE & RUBBER COMPANY

New Brunswick **New Jersey**



MACK TRUCKS IN ALASKA

IN Juneau, Alaska, over 1,000 miles north of Seattle, a 1-ton MACK worm drive truck in the service of the Juneau Dairy is attracting much interest and attention.

The roads out to the Dairy are very narrow with sharp turns. The Dairy people state that recently when they had to carry some excessively heavy loads the truck climbed the hills through soft dirt without difficulty, and with no extra effort on the part of the motor. Mr. Smith of the Dairy company says the MACK has come up to, and exceeded all that was claimed for it, and when they have need of another truck *it will be a MACK.*

MACK trucks range over a wide field of uses and places and are consistent performers regardless of location.

Complete line 1 to 15 tons, worm or chain drive.

INTERNATIONAL MOTOR CO.
64th St. and West End Ave., New York

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LAMSON TRUCKS

5 Popular Sizes—Ready for Prompt Deliveries

1-Ton—1½-Ton—2½-Ton—3½-Ton—5-Ton Capacities

Motor—Wisconsin, 4 cylinder, long stroke.
Springs—Semi-elliptic. Steering Gear—Ross.
Axles—Sheldon. Tires—Optional.
Clutch—Borg & Beck. Transmission—Cotta.
Carbureter—Stromberg.

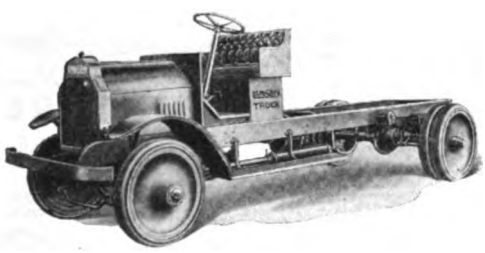
Gas Supply—Seamless steel tank with Stewart Vacuum System.
Ignition—Dual—Bosch Magneto and Atwater Kent Unisparker.
Governor—Duplex. Electric Lights—Vesta System.

Correspondence Solicited with Live Dealers and Distributers

LAMSON Trucks are actually manufactured in all sizes advertised, and in sufficient quantities to meet with prompt and satisfactory delivery all orders from dealers, fleet owners or individual users.

Every business requirement from light delivery to heavy hauling is covered by a LAMSON model. The field for sales is unlimited.

Lamson Truck & Tractor Co.
4644 W. Madison Street, Chicago



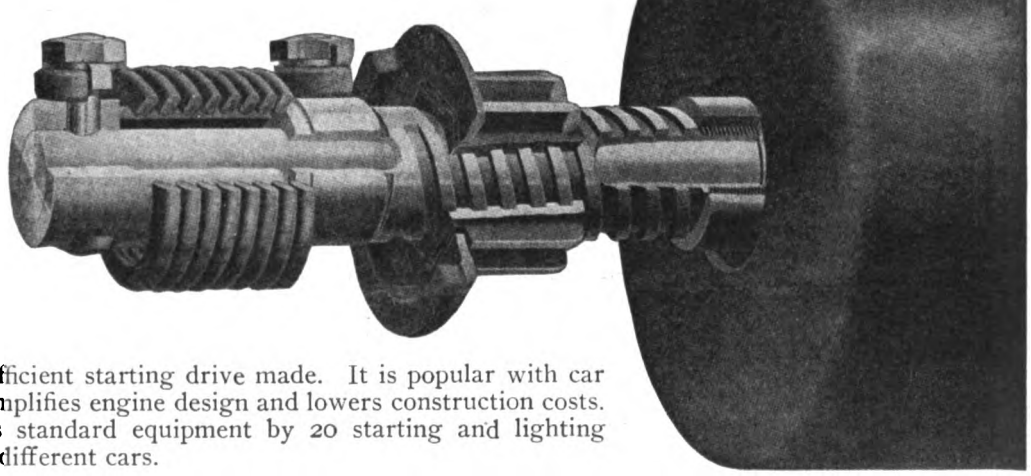
Chassis of a LAMSON 5-Ton Truck



LAMSON 2½-Ton Truck

The Most Popular Drive

ECLIPSE-BENDIX DRIVE



is the simplest and most efficient starting drive made. It is popular with car manufacturers because it simplifies engine design and lowers construction costs. It is regularly supplied as standard equipment by 20 starting and lighting systems and is used on 150 different cars.

The chief features of the Eclipse-Bendix Drive are, first, the direct gear starting drive it gives, by means of teeth cut in the flywheel—secondly, the automatic meshing and demeshing gear, which is drawn into mesh when the motor starts and is disengaged as soon as the engine is running faster than the starting motor—thirdly, the spring drive, securing a flexible drive and preventing back firing and stripped gears. This is shown in the illustration. The sleeve with the worm carrying the gear is driven by the internal shaft through the spring, giving the utmost flexibility.

The following starting lighting systems have standardized the Eclipse-Bendix Drive—

A-B-C	Gray & Davis	Robbins & Myers
Allis-Chalmers	John O. Heinze	Roth Bros.
Auto-Lite	Kemco	Splitdorf
Delco	Leece-Neville	Wagner
Detroit	North East	Ward-Leonard
Disco	North Western	Westinghouse
Dyneto	Remy	

ECLIPSE MACHINE COMPANY ELMIRA, N. Y.

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A Big Profitable Field for DEALERS

$ $ $

A Money-Maker Every Month of the Year—



FARM



EXPRESS



OIL DEALERS



FURNITURE



CONTRACTOR



HARDWARE



LUMBER

THERE are more live prospects for the Ford-Dearborn One-Ton Truck than for any other commercial car on the market. Grocers, farmers, contractors, lumbermen, expressmen, manufacturers, truck gardeners and scores of others are *real* prospects for the Ford-Dearborn.

You can sell the Ford-Dearborn to people who would not think of paying $1,500 for a truck (the price of the average one-ton truck). The Ford-Dearborn is actually far cheaper to operate than horse and wagon and many times more satisfactory and efficient.

The Ford-Dearborn Truck is a combination of the Ford chassis and the Dearborn Unit. It has all the economy, simplicity and efficiency of the Ford—and the strength of the Dearborn.

$350 and a Ford, New or Old, Makes a

FORD-DEARBORN One Ton Truck

90 per cent of the load is carried on the sturdy rear axle and heavy truck wheels. Full 9-foot loading space; any style body can be furnished. Wheels are of heavy artillery type with guaranteed hickory spokes and felloes; tires are solid rubber. Tread is standard (56 inches) same as Ford front wheels. Baldwin roller chains and Baldwin steel sprocket.

The Dearborn Unit is make complete in our own factory and is completely guaranteed in every detail. There is no other attachment like it. Any auto mechanic can attach it to Ford chassis in a few hours time.

Find out about the DEARBORN today. Write or wire for our Dealer's Proposition with complete information on the Dearborn Unit.

Dearborn Truck Company
1230 S. Campbell Ave. Chicago

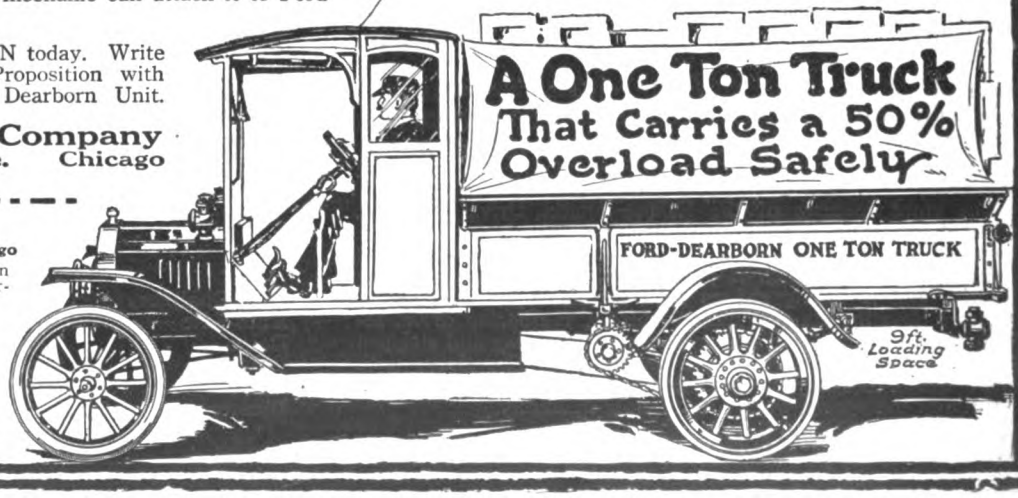
—·—COUPON·—·—·

Dearborn Truck Co.,
1230 S. Campbell Ave., Chicago
Send me your Dealer's Proposition and complete information on Dearborn Truck Unit.

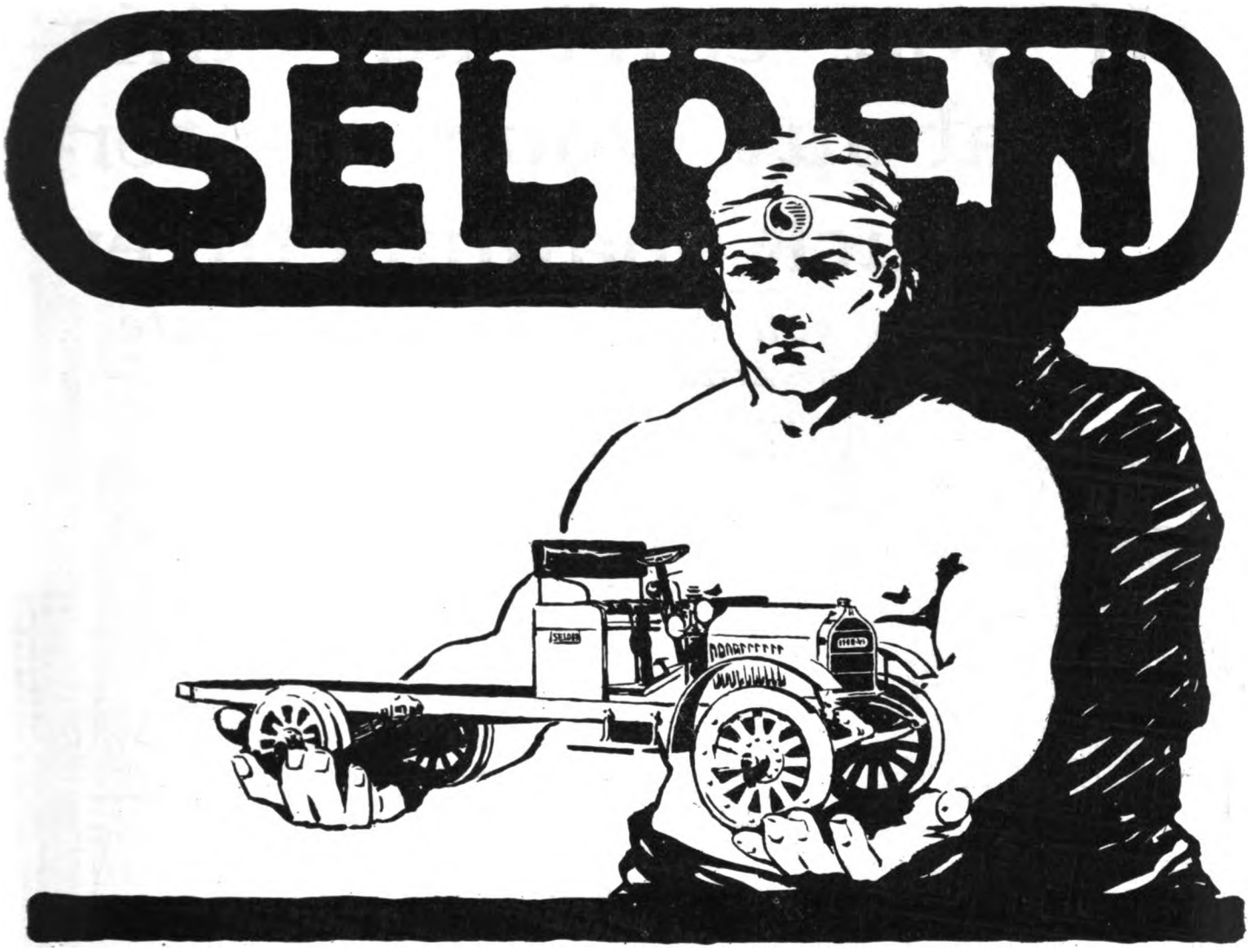
Name.....

Address.....

A One Ton Truck That Carries a 50% Overload Safely



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The Big, New One Ton
SELDEN TRUCK

CHASSIS PRICE **$1385** F. O. B. Rochester N. Y., U. S. A.

is actually the biggest one ton truck buy on the market today—more truck for the money. It is massive in construction—powerful—fast—built for long service—140 inch wheelbase and a frame of 9 feet 6 inches back of the driver's seat.

DEALERS: This truck has already proved itself a big seller. This is your opportunity. Get our Agency Proposition QUICK!

Selden Truck Sales Co.
Rochester, N. Y., U. S. A.

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If you can't say this about your motor truck manufacturer

you had better investigate

the ATTERBURY proposition

ATTERBURY MOTOR CAR CO.
BUFFALO N.Y.



COMMERCIAL VEHICLE MOTORS CO.
900-910 S. MICHIGAN AVENUE
CHICAGO, ILL.

February 7, 1917.

Mr. J. R. Spraker,
Gen. Mgr., Atterbury Motor Car Co.,
Buffalo, N. Y.

My dear Mr. Spraker:-

Answering yours of the 29th, I am glad that your visit to our Chicago offices made you so enthusiastic about our organization.

It is unnecessary to tell you that right straight through our entire corps, we feel the utmost confidence in the future of the Atterbury truck. When it comes down to genuine, whole-hearted cooperation with dealers, I do not believe there is any company in the country that can equal the Atterbury.

Your assistance is equal to the quality of your truck. That is about the best compliment we could utter.

Very truly yours,
COMMERCIAL VEHICLE MOTORS COMPANY
H. B. Harding
President

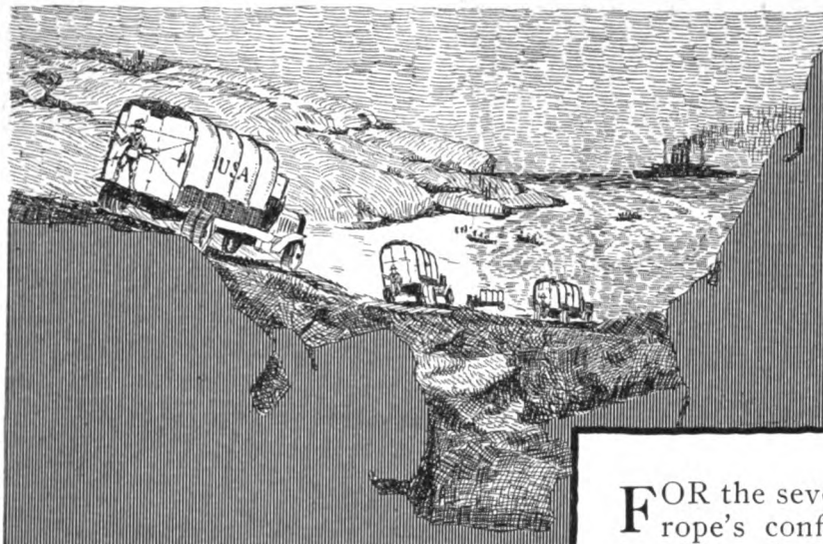
MOTOR TRUCKS OF ATTERBURY MAXIMUM SERVICE

ATTERBURY

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War or Peace, the Berling Aids Preparation

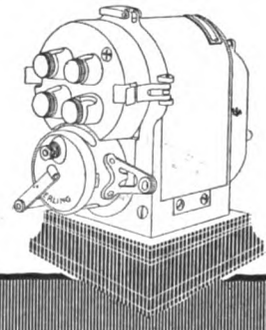


FOR the severest tests of Europe's conflict, the Berling has been chosen and has stood the test.

Whether for delivery of commodities to and from the station—or—for the transmission of soldiers and munitions—a Berlingized ignition is the surest kind of Preparedness.

Ericsson Mfg. Company

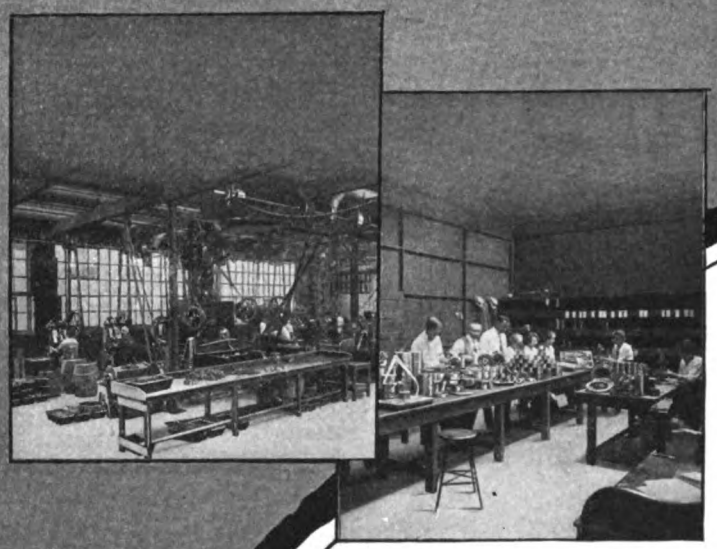
1184 Military Rd. Buffalo, N. Y.



Berling Magneto

Worth More Does More

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U. S. BALL BEARINGS
IN A MODERN, NEW
WITH A CAPACITY
BEARINGS

BALL BEARINGS offer least friction to the transmission of power

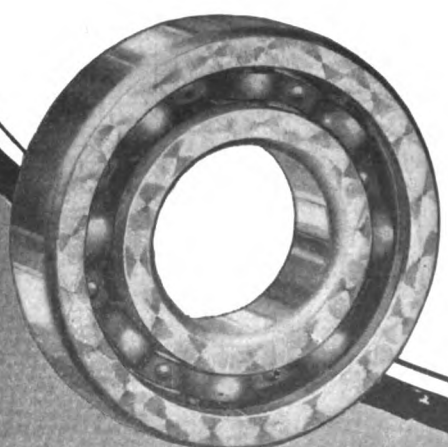
BALL BEARINGS offer exceptionally great carrying capacity

BALL BEARINGS wear longest

BALL BEARINGS have won every racing classic

BALL BEARINGS are used by practically every foreign manufacturer

BALL BEARINGS are always found where efficiency dominates cost



U. S. BALL BEARING
Conrad Patent Licensee
Palmer Street and Kolmar Avenue,

The U. S. Ball Bearing : : : : "The Balanced Bearing."

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U. S.

BALL BEARINGS

ARE MANUFACTURED
Y EQUIPPED FACTORY,
OF 10,000 QUALITY
DAILY

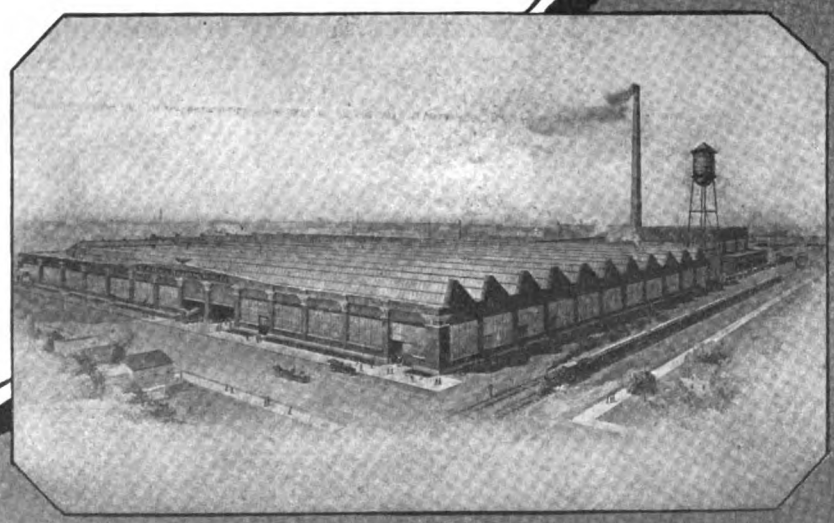
¶ Evidence of the character of U. S. Ball Bearings is shown in the fact that within four years' time the U. S. Ball Bearing Mfg. Co. has advanced from an obscure position to one of the largest manufacturers of high grade ball bearings in the world.

¶ This position of prominence has been attained fundamentally because all U. S. Ball Bearings are Quality Bearings—quality not alone from the standpoint of material used, but in manufacturing practice and design as well.

¶ Particular attention is called to the fact that one of the quality characteristics of U. S. Ball Bearings is that these bearings are what we term "balanced bearings":—balanced, in that there is just the right number of balls to supply the correct capacity to the proper sized raceways—that is, each component of the finished bearing is in perfect balance as to capacity and performance with each other component.

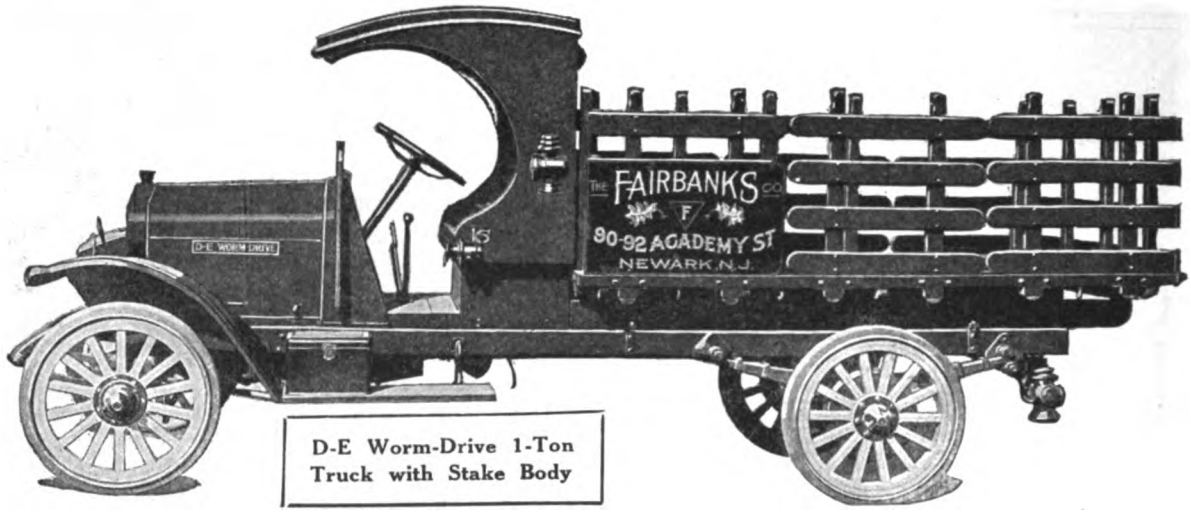
MFG. CO.

CHICAGO, ILL.



This magnificent factory is devoted exclusively to the production of U. S. Ball Bearings.

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D-E Worm-Drive 1-Ton Truck with Stake Body

D-E WORM DRIVE MOTOR TRUCKS

¾-Ton $975—1-Ton $1250—1½-Tons $1500—2½-Tons $2000

D-E Worm-Drive Motor Trucks are built on the theory that if the best a man can do is no better than another man can do, the best best thing he can do is quit.

We have put into D-E Worm-Drive Motor Trucks so much more *value* than any other trucks at their prices, that to tell the simple truth about them may sound like an overstatement. But go over them from radiator to rear axle, and your practised eye will tell you that there is not another Worm-Drive truck proposition in America to compare with the D-E. They fairly bristle with selling arguments—sales-clinching features.

Before you make a decision to take on a line of motor trucks, write or wire us for complete specifications and dealer proposition, and we will warrant that you will be quick to decide in favor of the D-E Worm-Drive line—for the profit-making possibilities are simply irresistible. Write or wire TODAY.

DAY-ELDER MOTORS CORP. D WORM DRIVE E NEWARK N.J. U.S.A.

GENERAL SALES OFFICES:
1459 Broadway, New York
P. K. HEXTER, Sales Manager

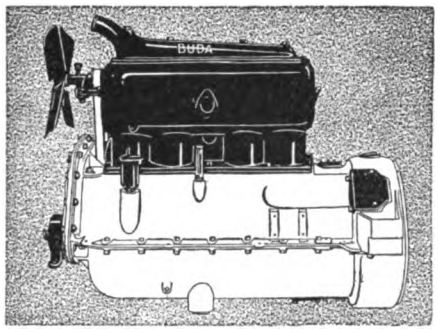
DAY-ELDER MOTORS CORP.

Manufacturers of
D-E WORM-DRIVE MOTOR TRUCKS
165 Ogden Street
NEWARK NEW JERSEY, U. S. A.

"Built and Sold for Everlasting Service"

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"LET US HAVE THE FACTS"—No. 1



VOLUMETRIC EFFICIENCY

if theoretically perfect would mean filling the cylinders 100 per cent full of fresh gas on each cycle. This target is too high to hit, of course, but the BUDA MOTOR comes exceptionally near it.

The BUDA MOTOR

has its high Volumetric Efficiency assured:

1. By surrounding the intake manifold with a hot water jacket.
2. By providing an intake manifold free from sharp bends, and smooth inside.
3. By designing and locating the valve pockets so as to offer the very least resistance to the flow of gas during both intake and exhaust strokes.
4. By using the utmost care to provide the precisely correct relation between opening and closing of intake and exhaust valves.

The BUDA MOTORS for cars, trucks and tractors bear the closest technical examination. Try it.

THE BUDA COMPANY, HARVEY (Chicago Suburb), ILL.

THE BUDA COMPANY
BUDA MOTOR
"The part to buy the car by"
ESTABLISHED 1881

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The Truck That Always Meets the Emergency

THE HALL TRUCK does not charge for its extra service—in fact, it has actually proved itself the biggest cost cutter in the business—but it always has that extra speed and strength up its sleeve ready for the big emergency when it does come.

This picture shows a Hall Truck of 3½-ton rated capacity carrying 5½ tons of six-cylinder Continental Motors—two full tons in excess of the factory guarantee.

That means *two trips* instead of *three!* You can figure the saving for yourself—a saving of time, labor, gasoline and oil.

The Hall does this sort of thing frequently to help its owner in a tight place. We do not advise the *continual* overloading of *any* truck, but we do know that the Hall has this extra strength when needed and has never failed any owner in an emergency.

It is a big, burly, two-fisted truck, with the strength and agility of a trained athlete. For in spite of its superior endurance it is lighter in weight and far speedier than many trucks of less capacity.

Considering these attributes of strength and speed, in conjunction with the simplest, speediest, most efficient dumping device known (Improved Wood Hydraulic Hoist), it is small wonder that the Hall Truck has proved itself the lowest cost per ton-mile hauler in the heavy duty class.

DEALERS: We will help you finance your sales on the partial payment plan, in addition to giving you quick deliveries and every sort of sales help and service. Write for proposition.



Lewis-Hall Iron Works

Manufacturers of the Hall Truck
(Established 1873)

Ferry Ave. & Grand Trunk R'wy
DETROIT, MICH.

Five Models: 2-ton, chain, $2,000; 3½-ton, chain or worm, $2,800; 5-ton, chain or worm, $3,600.



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Russel

THE RUSSEL INTERNAL GEAR AXLE is an evolution from the chain drive in the manufacture of which we were specialists for years.

The Russel Drive gives the same efficiency as chains and sprockets when new, but it is noiseless and the internal gears will outlast the other working parts of a truck.

Regardless of conditions of load and road, it is always efficient at low speed or high speed, out of ruts, through deep snow, mud or sand.

Russel



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Solid Round Bar Load-Carrying Axle.

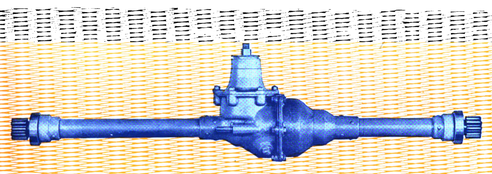
THE load-carrying axle of the Russel Drive is a round bar of chrome-nickel steel, heat-treated which lessens that crystallization to which axle breakages in other types and makes can be directly traced.

The use of this type of axle, on heavy locomotive and freight cars, has demonstrated it to be the strongest type of load-carrying axle.

The Russel axle is the only American made Internal Gear Drive Axle with spindles integral with the dead axle. This insures the greatest factor of safety.

Russel

Digitized by Google



RUSSEL Jackshafts were standard for years—(we furnished more manufacturers of one to two ton trucks their jackshafts than any other axle manufacturer).

The Russel Jackshaft is the power-transmitting part of the Russel Drive, with the substitution of internal gears for the old chains and sprockets.

We make our own differential and internal gears, and can guarantee quiet-running axles.

Russel Axles have always had reliable brakes, which are one of the most essential factors in the serviceability of a motor vehicle.

Our experience in the manufacture of truck axles has enabled us to perfect our brake construction, so that Russel brakes are the best liability insurance for the truck owner.

Russel

Powerful Drive Axle



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IN May we will be able to add to our present line of internal gear axles, an axle adapted for a three ton truck.

Our internal gear line will then consist of one ton, two ton and three ton axles.

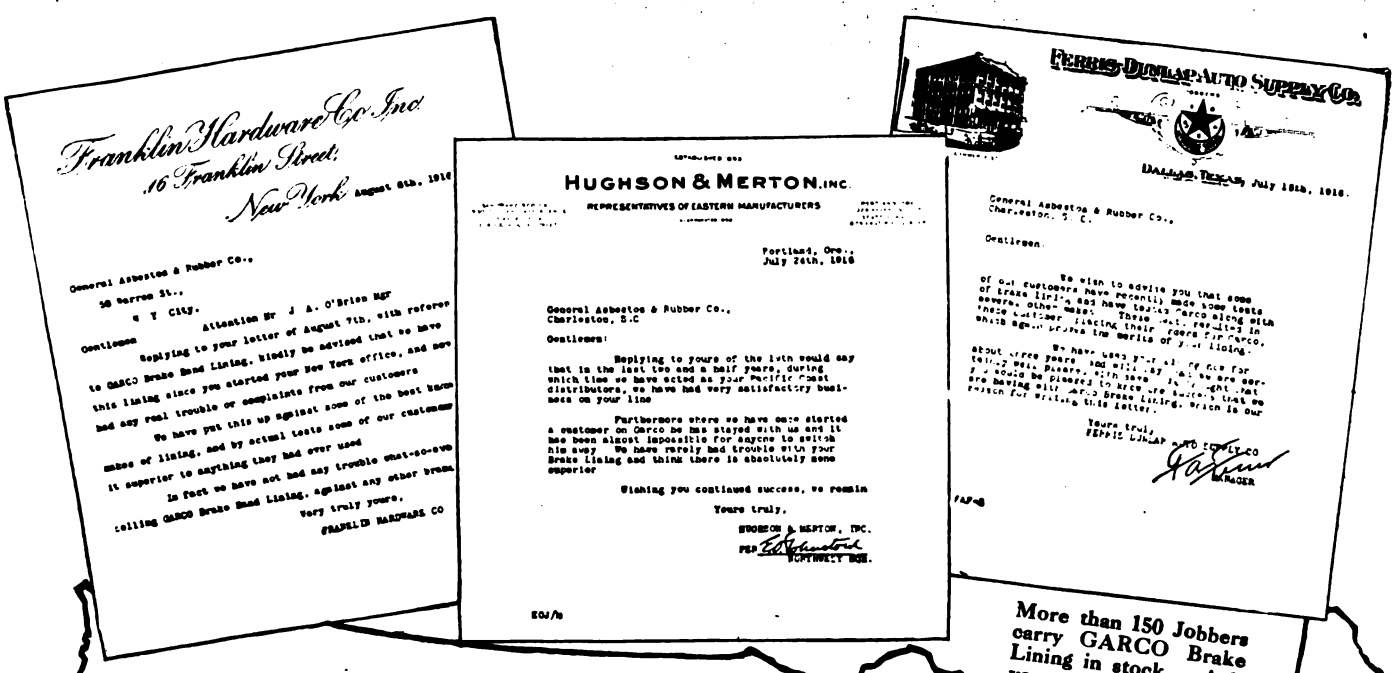
New extensions to plant and machinery will enable us to increase our production to meet the rapidly growing demand there is for the internal gear drive axle.

For all internal gear drive axles are the best motor truck axles—and we believe that Russel makes the best one.

Russel

MOTOR AXLE CO.—North Detroit

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Franklin Hardware Co. Inc.
16 Franklin Street,
New York August 6th. 1916

General Asbestos & Rubber Co.,
58 Warren St.,
N Y City.

Attention Mr J A. O'Brien Mgr

Gentlemen

Replying to your letter of August 7th, with referen to GARCO Brake Hand Lining, kindly be advised that we have this lining since you started your New York office, and we had any real trouble or complaints from our customers

We have put this up against some of the best kno makes of lining, and by actual tests some of our customers it superior to anything they had ever used

In fact we have not had any trouble what-so-eve selling GARCO Brake Hand Lining, against any other brand.

Very truly yours,
FRANKLIN HARDWARE CO

HUGHSON & MERTON, INC.
REPRESENTATIVES OF EASTERN MANUFACTURERS

Portland, Ore.,
July 26th, 1916

General Asbestos & Rubber Co.,
Charleston, S.C

Gentlemen:

Replying to yours of the 14th would say that in the last two and a half years, during which time we have acted as your Pacific Coast distributors, we have had very satisfactory business on your line

Furthermore where we have once started a customer on Garco he has stayed with us and it has been almost impossible for anyone to switch him away We have rarely had trouble with your Brake Lining and think there is absolutely none superior

Wishing you continued success, we remain

Yours truly,
HUGHSON & MERTON, INC.
PER
MANAGER

EGJ/b

FERRIS-DUNLAP AUTO SUPPLY CO.
DALLAS, TEXAS July 18th, 1916.

General Asbestos & Rubber Co.,
Charleston, S. C.

Gentlemen.

We wish to advise you that some of our customers have recently made some tests of brake lining and have tested Garco along with several other makes. These tests, recorded in these customer placing their orders for Garco, which again proves the merits of your lining.

About three years and will be for [illegible] Dallas, with some [illegible] are having with Garco Brake Lining, which is our reason for writing this letter.

Yours truly,
FERRIS DUNLAP AUTO SUPPLY CO
MANAGER

FAF-B

More than 150 Jobbers carry GARCO Brake Lining in stock. Ask yours to supply you.

SATISFACTION—

From Portland to Portland—from Dallas to Duluth—hundreds of jobbers, dealers and motor car owners have paid voluntary tribute to the quality built into GARCO Brake Lining. Even these few letters shown here testify to the *satisfaction* of every GARCO user more clearly than anything we could say.

GARCO

Your success can only be built on the basis of satisfied customers. Every time you use GARCO for a renewal job you not only make a substantial profit but make a strong bid for all the future business from your customer. Ask your jobber to tell you about the complete line-up of selling helps furnished free to GARCO dealers or write us direct.

GENERAL ASBESTOS & RUBBER COMPANY

Main Offices and Factories CHARLESTON, S. C.

BRANCHES: 58 Warren St., New York 311 Water St., Pittsburgh, Pa.
530 Golden Gate Ave., San Francisco, Cal.
106 West Lake Street, Chicago

TRADE ARCO MARK

Southern Auto Supply Company
DISTRIBUTORS AUTO SUPPLIES AND SPECIALTIES
WHOLESALE AND RETAIL
CHATTANOOGA TENNESSEE

August 4th, 1916.

General Asbestos Rubber Co.,
Charleston, S C

Gentlemen:-

We have been using Garco Brakelining for more than two years. We have sold extensively to the trade in this section and are pleased to state that we have received some but satisfactory reports from our many satisfied customers.

A brakelining that will hold in this mountainous country is certainly a good brakelining.

We frankly say that Garco will hold on the steepest mountain roads longer than any other we have ever

Yours very truly,
SOUTHERN AUTO
Per
SEC'Y

SAS-J

SPEARS & RIDDLE CO.
MILL, MINE AND FACTORY
SUPPLIES
WHEELING, W. VA.

General Asbestos & Rubber Co., 6/19/16.
Charleston, S. C.

Gentlemen.

We have your letter of the 2d. We are certainly delighted to hear that you are starting an advertising Campaign on Garco We haven't the least doubt this will be of great assistance to all your dealers.

You know we have been handling Garco Lining exclusively for about 2 years and in that time we do not recall that we have ever had a complaint or ever had a foot of it returned.

Garco is one of the things that we have implicit faith in. We always feel when selling a man Garco that he will be a satisfied customer and that we will get repeat orders We also know that he is getting full value for his money.

We hope by the aid of your Advertising Campaign to very materially increase our sale of Garco Lining.

Yours truly,
SPEARS & RIDDLE CO.

SRS/HM

HUGHSON & MERTON, INC.
REPRESENTATIVES OF EASTERN MANUFACTURERS

SEATTLE, WASHINGTON,
JULY 20 - 1916.

General Asbestos & Rubber Co.,
Charleston, S. C.

Gentlemen

Replying to your communication of July 19th with reference to Garco Brake Lining.

We wish to advise that since January first we have sold about 60,000 ft. of the Ford size alone and the same has given entire satisfaction. This is exclusive of other sizes which also have given perfect satisfaction.

Yours very truly,
HUGHSON & MERTON, INC
BY

FS.SEH

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KisselKar Truck used by Philip Fresenius Sons, New Haven, Conn.

KISSELKAR TRUCKS

Light delivery to the heaviest duty ably performed by seven sizes of KisselKar Trucks ranging in price from $950 up.

DEALERS

Many Kissel dealers trebled their truck sales in 1916 over 1915. The reasons—superior quality and unusual price value.

There is an extremely attractive 1917 proposition open for a few more desirable dealers.

The frequent selection of KisselKar Trucks in preference to others is due to three fundamental things that investigating truck buyers consider: EXPERIENCE—REPUTATION—PERFORMANCE.

Many of these trucks have been in daily commission for years—lopping off thousands of miles of **dependable** service, and still on the job.

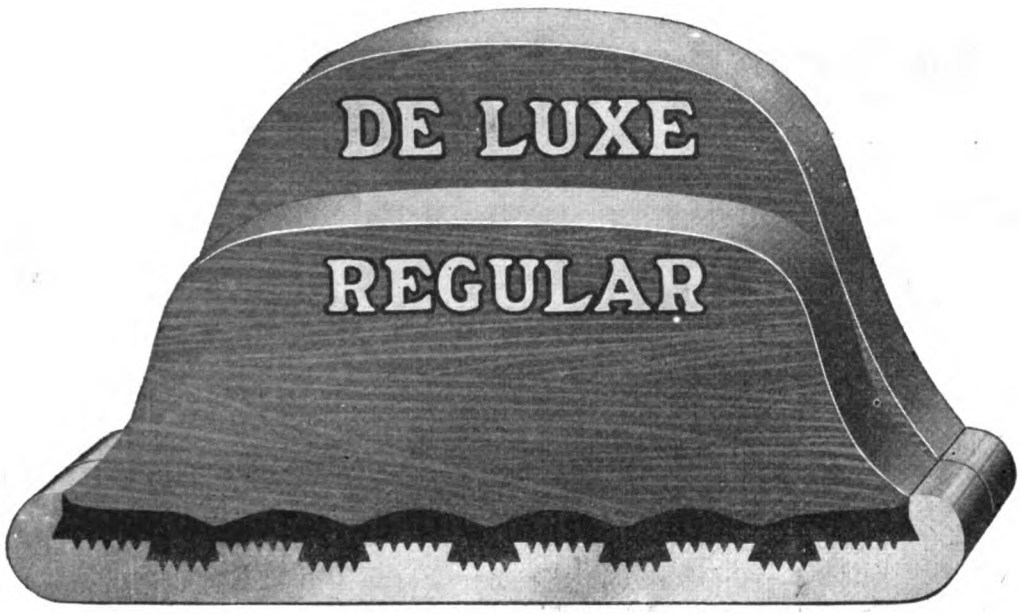
They set a hustling pace for every department of those establishments employing them.

Send for literature and give the facts of your haulage problem. It will cost nothing. Why not start matters by writing today?

KISSEL MOTOR CAR CO., Hartford, Wis.

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Long Life
from



GOODRICH DE LUXE TRUCK TIRES

Every time a tire revolves under a load the rubber is compressed and released. The heavier the load, the harder the pressure. This action, repeated indefinitely, tends to destroy the rubber fibre.

Ordinary tires may break down from this cause, especially if they are overloaded, due to their lower limit of displacement. They are literally knocked to pieces.

Goodrich **De Luxe** Tires with their extra thick tread of tough, springy rubber, withstand this destructive action because they have a larger factor of safety for displacement. Another reason why users say they deliver "Velvet Mileage."

The B. F. Goodrich Company, Akron, Ohio

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DEALERS
Here Is The
MOTOR TRUCK PLUS
The GLOBE Truck



Here Is Extra Value Plus a Selling Force and Service That Is Unusually Intensive Unusually Complete

Stop! thinking high prices.

Look! at Real Value.

Listen! to these specifications. They tell the story.

All models include the chassis painted and ready for the road, except bodies. Internal gear or worm drive.

1 - ton capacity
$1375

2 - ton capacity
$1985

3½-ton capacity
$3185

The GLOBE is a proven truck, in the hands of satisfied users throughout the country—making good in every line of business that permits the use of a motor truck of 1-ton, 2-ton or 3½-ton capacity. One-ton GLOBE Trucks are super-trucks in every detail. Over-size in every vital part. Cut to fit the individual ideas of every business.

Traveling experts from the factory, intensive sales co-operation, semi-monthly dealer bulletins — every possible service feature backed by advertising that is right, make GLOBE Trucks easy to sell, at prices prospects willingly pay.

WRITE TODAY for free illustrated literature and details of dealers' opportunity offered. Globe friends multiply Dealers' profits.

Globe Motor Truck Company
418 Victoria Building, St. Louis, Missouri

SPECIFICATIONS

Motor—Continental.
Carburetor—Master.
Ignition — Eisemann, Waterproof.
Clutch—Multiple dry disc.
Radiator—Built-up, cast with core—having removable sections.
Transmission — Selective — Three forward speeds and reverse. Left drive and center control.
Drive—Internal gear or worm gear.
Front Axle—Drop forged I-beam.
Rear Axle—Internal Gear—Celfor. Worm Gear—Timken.
Front Springs—Semi-elliptic.
Rear Springs—Semi-elliptic.
Wheels—Artillery type.
Tires—34x3½ front—34x4 rear.
Frame—Special carbon channel steel.
Wheel Base—136 in. Tread 56 in.
Colors—Standard—Coach green with lemon yellow striping or battleship gray with black striping.
Gasoline Capacity—16 gals.
Body—Standard Express or Stake type.

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QUALITY CAPACITY ECONOMY

The finest steel, the most highly specialized workmanship, the latest mechanical devices for insuring accuracy, combine in producing Fuller Transmissions.

In actual service, these transmissions have demonstrated an ability far beyond the ordinary, an economy of upkeep, a consistency of performance that has placed them in the leading position they now occupy in the opinion of Manufacturer, Engineer and Owner, alike.

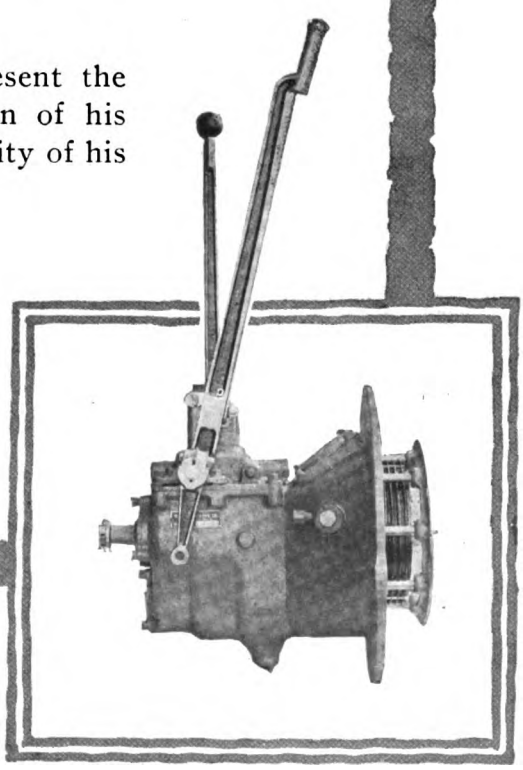
FULLER TRANSMISSIONS

In point of silent operation, of ability to endure hard and continuous service, of full delivery of power, these transmissions have made an impressive record.

To the Truck Builder, they represent the safest insurance for the reputation of his power plant and the delivery capacity of his product.

Fuller & Sons Mfg. Co.
Kalamazoo Michigan

EARLE & BOGGS
1790 Broadway, N. Y. City
Eastern Representatives



PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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F-W-D Pay Dividends

F-W-D TRUCKS

THE investment value of a truck begins with the Company that builds it.

The truck buyer must be assured that the Company will be able to render service during all the years that his truck will be in use.

The Four Wheel Drive Auto Company is the oldest exclusive manufacturer of Four Wheel Drive Trucks in the world.

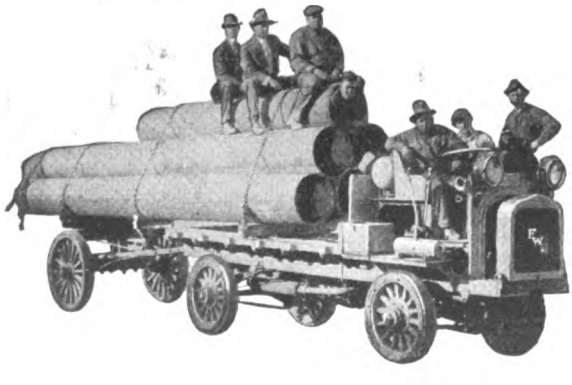
That the original engineering idea of the F-W-D Truck can be depended upon has been proved by the absence of any radical changes made since then and the fact that the first F-W-D is still in service.

The Four Wheel Drive principle as developed in the F-W-D Truck has proved to be a vital factor in extra life, extra efficiency, extra economy and general dependability under all conditions of road, load and service.

IN brewery service, trucks are subjected to practically continuous work regardless of weather or road conditions. The J. P. Binzel Co., of Beaver Dam, Wisconsin, operating an F-W-D, writes:

"Our F-W-D three-ton truck purchased July 27, 1913, has run 31,320 miles. During this time it has never been in a garage for adjustment of any sort, and it has never been laid up a single day for repairs. The truck has run, up to the present time, on the original set of Goodrich tires furnished with the machine, and we have just now bought our first set of new tires. The load varies from 2½ to 3 tons. The route is mostly over ordinary country roads, and we average six miles to the gallon of gasoline, and 467 miles to the gallon of oil."





"I am now driving this three-ton F-W-D Truck, mounting a bolster and fifth wheel on the chassis and drawing a two-wheel trailer, the outfit frequently being loaded with six tons of oil well casting, going over very hilly, alkali roads, with mud worse than up to the hubs; on some occasions the hubs being buried out of sight, with the transmission dragging on the ground," writes Mr. Chas. E. Fox, of California, "and yet the F-W-D pulled out easily under its own power, though I found it necessary to attach skid chains on all four wheels. Permit me to say that this was a performance that I have yet to see any other truck make, and I have driven practically all of the best of them."

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In Service



THE efficiency of F-W-D Trucks is greatly increased by their ability to handle trailers. Mr. J. Neumiller of Milwaukee, Wis., expresses his experience in a recent letter as follows:

"I use trailers almost continually in conjunction with these trucks, and my average load has been as follows: 3 to 4½ ton on the truck and 5 to 6½ ton on the trailer. Under these conditions the truck seems to handle itself with ease and there is no apparent strain upon any part. Gasoline mileage when using the trailer averages about five miles per gallon, without the trailer I get about eight miles to the gallon. The oil consumption is unusually low and the tires on both trucks seem almost new in spite of their seven months of steady wear. With a capacity load on the truck and trailers behind, the trailed load consisting of fifteen ton, I had no difficulty in making an eight per cent grade. The weight of the entire load was eighteen ton. I know that with a rear-driven truck this latter is absolutely impossible. Wish to state that I heartily endorse and strongly recommend the F-W-D Truck to anyone contemplating the purchase of a motor truck. I have found by actual running test that F-W-D is the cheapest truck in spite of the fact that its selling price seemed high at first. I never have my trucks idle owing to adjustments and repairs, and my actual operating expenses are far below those of other rear-driven trucks."



WILLIAM CLARK, of Philadelphia, Pa., writes: "I have been using her for two years, and I have found her equal to her work. I have had on this truck 4 tons and 8 cwt., carried just the same as 3 tons. She will load two ton and trail five ton. I have gotten seven miles to one gallon of gas, heavily loaded. I have run her 200 miles on a gallon of oil. I average three-ton loads. Condition of roads fair. She will pull hills and mud roads better than any other truck built. I have pulled her with three ton up grade in mud to both axles for one-quarter of a mile. No rear drive truck could do it. For first year, repairs none. Second year about $300. One set of tires will run her 15 months. We travel all over from Philadelphia to New York, Boston, Washington and sea shore places within 200 miles."

The even distribution of power means traction in every wheel, consequently, greater efficiency on smooth roads and ability to go through sand and mud, over icy places, over obstructions that could not be negotiated by rear drive trucks.

The new catalog tells in a simple and convincing way how and why F-W-D Trucks give continuous and satisfactory service year after year. It explains many reasons for

Dependability	*Accessibility*
Durability	*Economy of Fuel*
Continuous Service	*Economy of Tires*

All these points can be demonstrated so clearly as to convince every business man that F-W-D Trucks are an investment that pays dividends in service.

Dealers who desire to build up a truck business on the sound basis of continued satisfaction to their customers, are acceptable in unoccupied territories. To such we will gladly send details of our dealer's agreement, prices, discounts and terms.

Write for the new illustrated catalog.

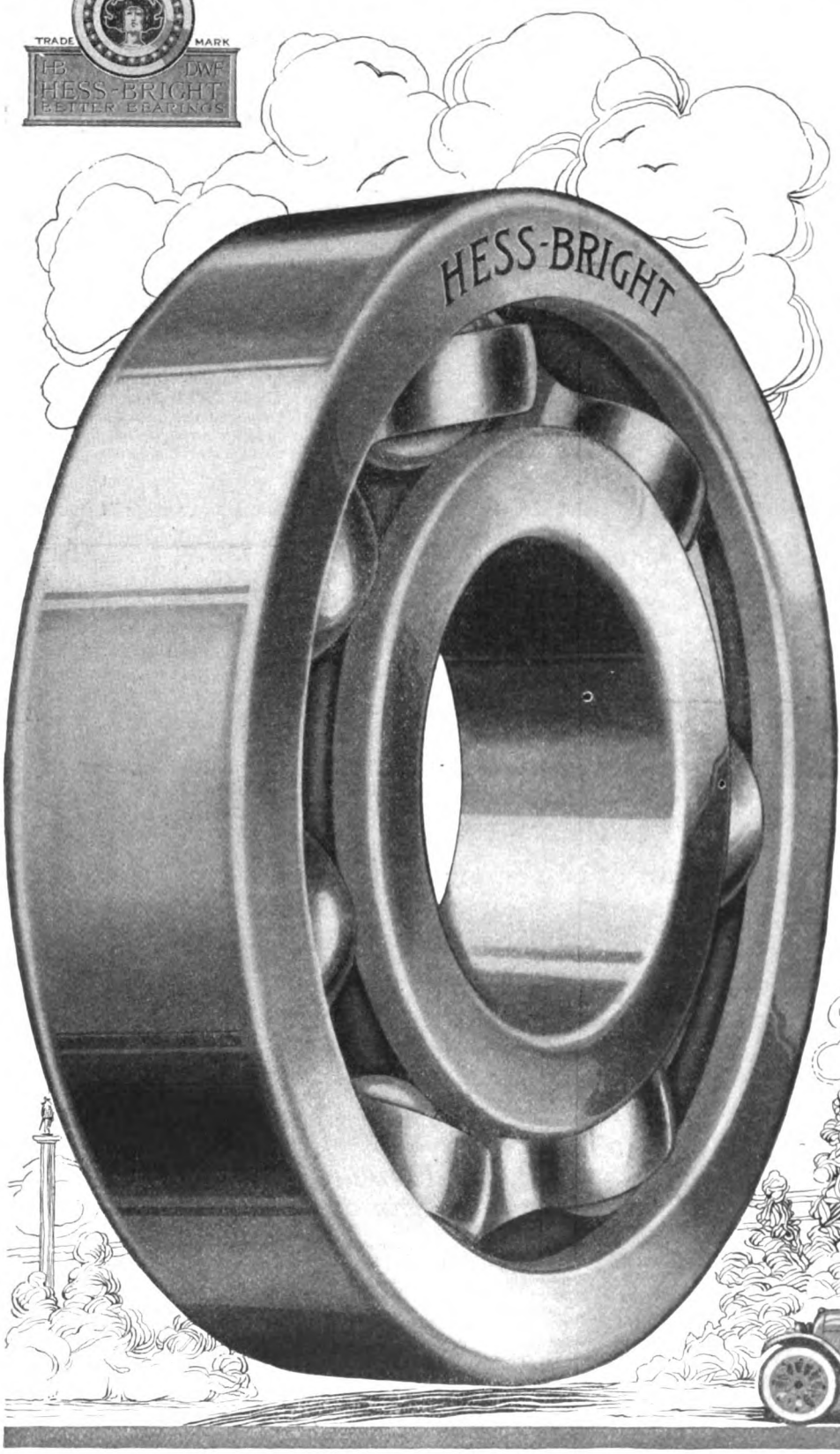
FOUR WHEEL DRIVE AUTO CO.

Dept. K **CLINTONVILLE, WIS.**

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HESS-BRIGHT'S CONRAD PATENTS ARE THOROUGHLY ADJUDICATED

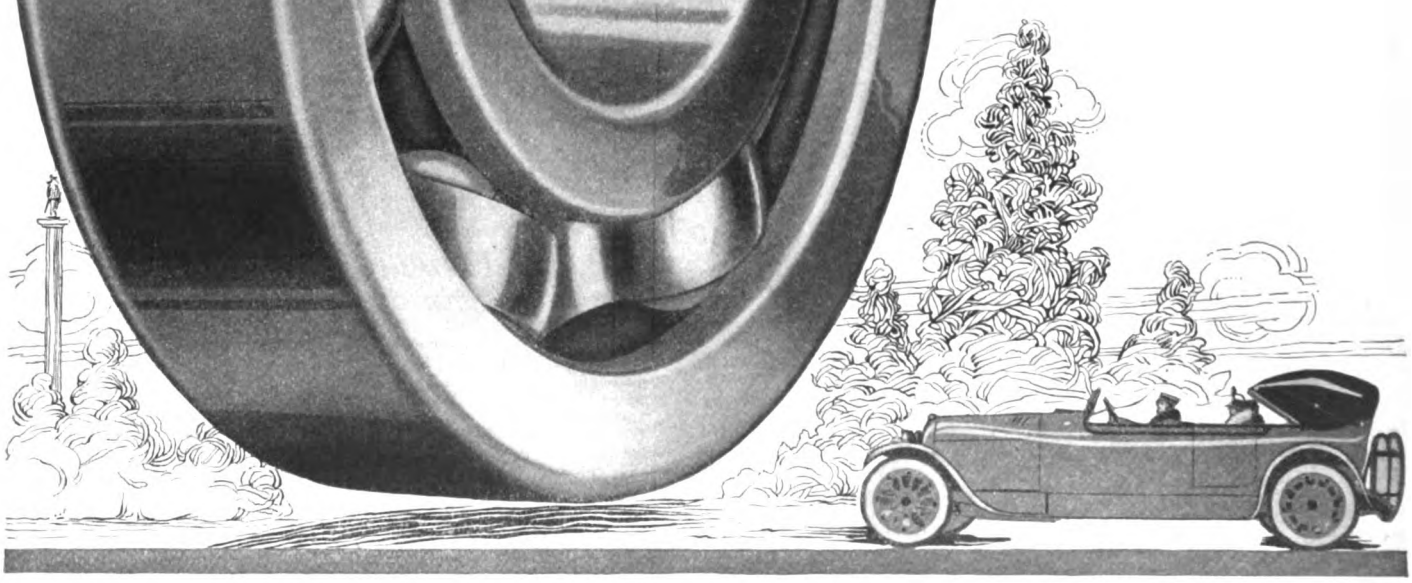
TRADE MARK
HB DWF
HESS-BRIGHT
BETTER BEARINGS



IF we could take you through the factory of the HESS-BRIGHT MFG. CO. and evidence to you the consideration that has been given to the comfort and health of the employees; if you could see the spirit of co-operation everywhere present; if you could "feel" the good fellowship that pervades the organization—then you would realize *why* HESS-BRIGHT BALL BEARINGS are *"Better Ball Bearings"—why* every bearing in its perfection is simply a reflection of the intentions of its makers.

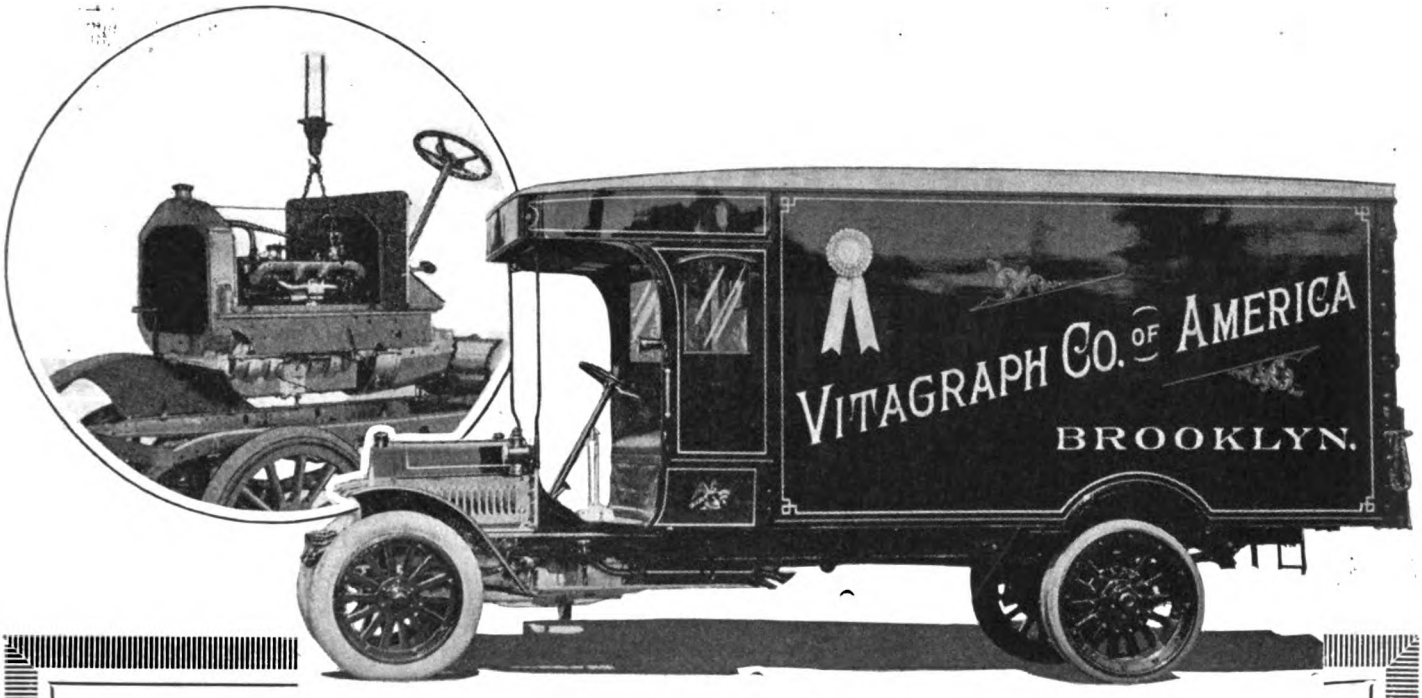
THE HESS-BRIGHT
MANUFACTURING CO.
PHILADELPHIA, PA.

Hess-Bright Distributors for Retail Trade in Every City of Importance



HESS-BRIGHT BALL BEARINGS

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The truck that keeps out of the repair shop
***That* is what the knowing ones call the**

MACCAR

That reputation is not merely the result of good materials, sterling parts and high-grade workmanship, but is largely due to the exclusive incorporation in the Maccar of the

Mueller Demountable Power Unit

This unit consists of the motor, clutch, transmission, radiator, pump, magneto, carburetor, dash, toe boards, brake and foot pedals, steering gear and all spark and throttle controls—all assembled in one cradle, mounted in the frame as a unit and removable as such in a few minutes by taking off six bolts and making several disconnections.

As most of a truck's trips to the repair shop are for repairs or replacements in the power plant, the fleet owner can avoid this tremendous loss of time by keeping in reserve an extra Mueller Unit. If a repair was needed this Unit could be substituted for the one in the truck in a half hour's time and the truck released for service.

No other truck has the Mueller Unit, and consequently no other enjoys the advantages it gives. Yet, important as it is, this is only one of a number of reasons why Maccar Trucks make hosts of friends in every service in which they are placed.

If you want to take on a good business building line of trucks turn your eyes on the Maccar. The four models, ranging from 1 to 5½ tons capacities, will enable you to secure a good share of the truck sales of your town. Write for our trade proposition to-day.

Maccar Truck Company, Scranton, Pa.

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The "Why" of The WINTHER Features

Every Winther Feature has its reason, a reason based on cold, hard facts—and army life.

The concentrated test of war-time service—a test equal to years of commercial use—enters into the selection of every part of the first and only complete line of American-made, heavy duty, internal gear motor trucks.

During the recent Mexican outbreak Mr. Martin Winther lived on the border. He watched closely the movement of trucks, and their ability to make good. He noted their weak points—and the substitution of strength. He brought back his observations to the **Winther**, and embodied them in its—

Internal Gear Drive, Locking Differentials, Drop Forged Axles, Timken Bearings, Four-Bearing Crank Shaft, Force Feed Oiling, Optional Wheelbases, Variable Frame Lengths, 3½% Nickel Gears, Constant Mesh Transmission, Vanadium Steel Springs, etc.

The four **Winther** models blanket their field—sturdy, reliable, tried.

Model 47—1½ to 2-ton, Maximum, 4,000 lbs.
Model 67—2½ to 3-ton, Maximum, 6,000 lbs.
Model 87—3½ to 4-ton, Maximum, 8,000 lbs.
Model 127—5 to 6-ton, Maximum, 12,000 lbs.

We have a liberal distributor's offer for a few well-organized and well-financed dealers.

WINTHER MOTOR TRUCKS KENOSHA, WIS.

4 Models

3,000 to 12,000 Pounds Capacity

The Winther Motor Truck Company

Kenosha **Wisconsin**

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Announcing

"The Baby Wood"

HYDRAULIC HOIST

(TYPE "E")

—the lightest,
—the simplest,
—the most positive,
—the quickest-working

And the **most easily installed** dumping device made;

—the inevitable choice—therefore—of the 1917 buyer of light dumping equipment.

Expressly designed for trucks of 2-ton capacity; but equally adaptable to one and 3-tonners.

Supplied with new special model rear-dump body, forming an ideal combination for every manner of light hauling and dumping.

Weight approximately 250 lb.; requires a space of only 13½ inches between body and seat; body arms are outside of chassis frame.

Made to fit any chassis.

With production about to begin on this new model and every indication of a nation-wide demand, we again recommend that prospective buyers of this type of equipment communicate without delay.

Particulars upon request. Address all inquiries to Detroit.

Wood Hydraulic Hoist and Body Co.

Sole Manufacturers

NEW YORK **DETROIT** CHICAGO

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive $1095 | **Two-Ton Worm Drive $2200** | **Three-and-One-Half-Ton Worm Drive $3100**

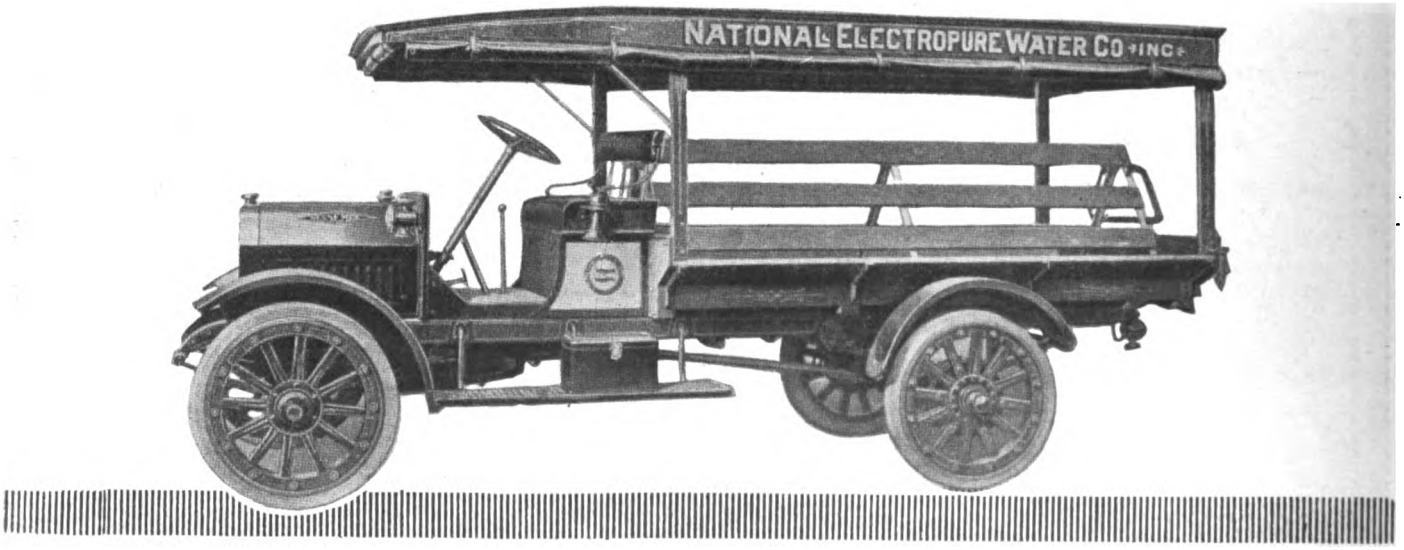
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

Bessemer Motor Truck Company **Grove City, Pa.**

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State



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What Signal "*On the Job*" Means to the Manufacturer

The best purchasing agent is the one who keeps the raw material coming in a steady flow to meet your manufacturing requirements; who handles his job so skillfully and reliably that you do not have to worry about him who, in a word, "is on the job."

The best sales manager is not the sensational exploitive character who is continually endeavoring to impress you with his powers, but the energetic, able man who sells all you can make at a profit, and keeps your customers satisfied. "On the job" describes his ability, too.

The virtues of the factory superintendent who handles his work so easily and smoothly that the factory becomes a huge, efficient, producing organization may be summed up by the statement that he is "on the job."

Whether in dealing with men or machines, the expression describes the sum of all desirable values. The man who is "on the job" does not need to explain—he delivers the goods.

In the same way the expression "on the job" boils down into a few words all the desirable qualities of a good motor truck. Its quality is best evidenced by your unawareness of its existence. You can dismiss the truck problem if you know your motor trucks are "on the job."

We did not fix the slogan "on the job" on Signal Trucks. It is the condensed expression of the experiences of Signal Truck users—it fits the occasion because it describes the Signal Quality. The circle of buyers for whom this applies is growing larger every day. Write

Signal Motor Truck Co.

Detroit, Mich.



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The BIGGEST Manufacturer in the Motor Truck Industry—the GREATEST Sales Possibilities —the BROADEST Dealer Co-operation

One Every Four Minutes

Deliveries Guaranteed

13,500 Already Delivered

Smith Form-a-Truck

$350

f. o. b. Chicago

THE huge Smith Form-a-Truck factory is now turning out one Smith Form-a-Truck every four minutes. Work is being rushed to complete a second factory to double even this tremendous output. Over 1,600 Smith Form-a-Trucks were sold in January. February exceeded January by a large percentage.

13,500 Smith Form-a-Trucks are now in service in all parts of the country, in over 500 lines of business.

The Smith Form-a-Truck dealer organization is the third largest selling either pleasure cars or motor trucks.

Smith Form-a-Truck has already sold more than all other truck attachments combined or any other motor truck in a given time.

The Smith Form-a-Truck advertising and selling campaign is the biggest by far ever back of any dealer in motor trucks.

At the New York Automobile Show—at the Chicago Automobile Show—and all the big shows throughout the country, Smith Form-a-Truck was the one selling sensation. Dealer contracts—orders from purchasers—were stupendous. Smith Form-a-Trucks are being bought by users up to fleet equipment totalling several hundred on single orders.

Smith Form-a-Truck is your big opportunity if your territory is not already gone. If it is open, a wire from you is absolutely necessary to insure your consideration. Territory is being taken up so fast that we cannot promise anything to anyone.

Materials are on hand for 30,000 Smith Form-a-Trucks and we are anticipating demands for future big production a year in advance. You can get deliveries to satisfy your customers in any quantity. This we guarantee you. It is the only way you can do a successful business.

Tie up with Smith Form-a-Truck now, if it is not too late. Find out for yourself whether your territory is closed. Get in on the biggest selling success of the automobile or motor truck industry.

Smith Motor Truck Corporation

Manufacturers of Smith Form-a-Trucks

Executive Offices and Salesroom, Suite 911, Smith Form-a-Truck Building

1470 Michigan Blvd., Chicago

Eastern Branch	Kansas City Branch	Pacific Coast Branch	Southern Branch
1334 Broadway, New York	1808 Grand Avenue	Pico and Hill Sts., Los Angeles	120 Mariette St., Atlanta

Digitized by Google



One of many thousand GMC Trucks now in service in more than 200 different lines of business

"Let Your Next Truck Be a GMC"

GMC Trucks are not the lowest nor the highest price trucks.

They are trucks of highest quality sold at prices which are reasonable and consistent with their high value.

They are powerful—durable—economical trucks—trucks that are fitted for the work.

Because of their simplicity and accessibility they are readily understood and cared for by the average driver.

In buying GMC Trucks you save at the start and later.

You get trucks which have demonstrated their worth. Given reasonable care and attention, they will render years of satisfactory service, —operating and maintenance cost will be reasonable.

Write for copy of interesting booklet entitled "Old Sam's Experience."

Old Sam had the right idea

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Company

PONTIAC, MICHIGAN

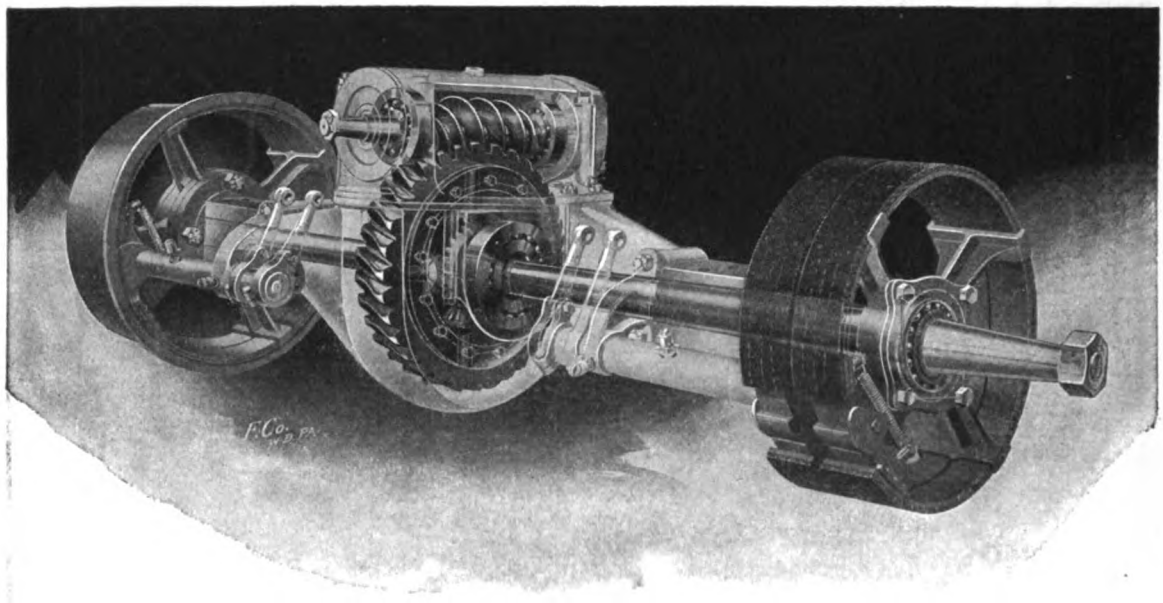
New York
Boston
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Chicago
St. Louis
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GMC
GENERAL MOTORS COMPANY
TRUCKS

(160)

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SHELDON

Semi-Floating Worm Gear Axles Are SOUND Axles

SOUND in design because they are simple.

SOUND in construction because of the high quality of their materials.

SOUND in performance because they are built to stand up under the rack and grind of heavy duty truck service.

"The highest priced axles in the world, and worth all they cost."

Sheldon Axle and Spring Company

Wilkes-Barre, Pa.

WINNER OF GOLD MEDAL AT PANAMA-PACIFIC INTERNATIONAL EXPOSITION

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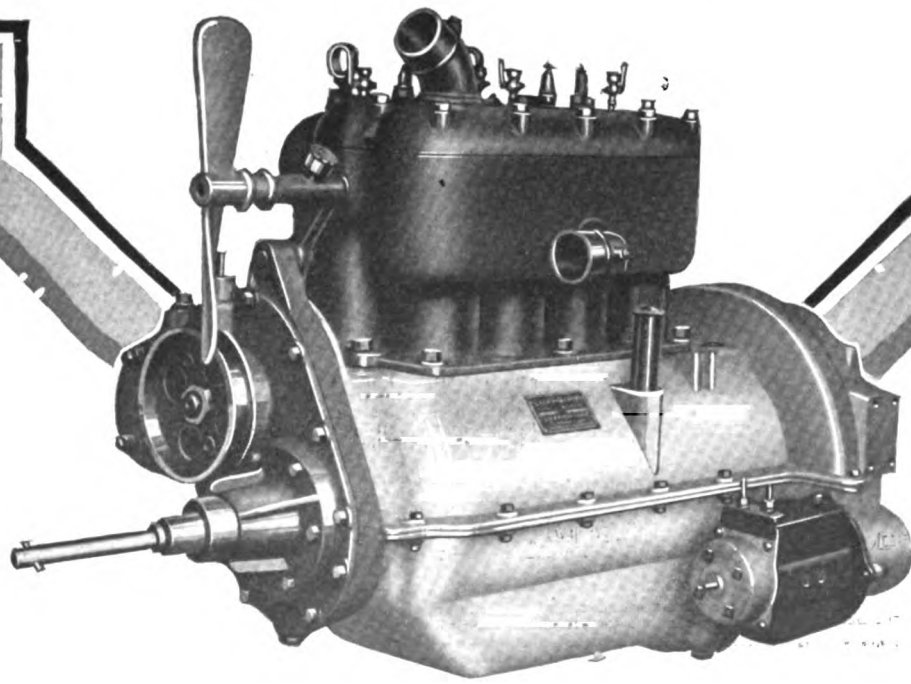
LYCOMING
LYCOMING
MOTORS

THE BIG POINT about the Lycoming Motor is its general excellence.

Every bit of metal is of the highest quality, carefully machined to exact dimensions; every part is exactly fitted and thoroughly tested.

Unusually well made, of the best material obtainable, these motors will last for years, giving uniformly excellent service.

Lycoming Foundry & Machine Co.
Williamsport, Pa.

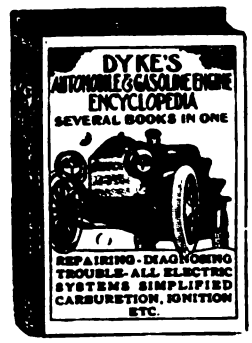


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Mechanical Instruction Books
For the Dealer

DYKE'S AUTOMOBILE and GASOLINE ENGINE ENCYCLOPEDIA



5TH EDITION—JUST OUT

A teacher, guide and reference on everything pertaining to motoring—simple as the A-B-C's.

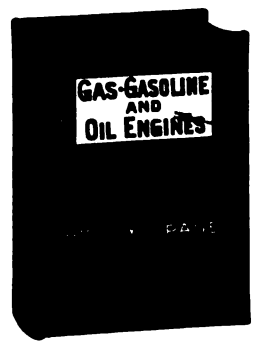
It's worth ten times its cost, if only placed on the shelf and used as a reference.

2370 Illustrations. 824 Pages. 50 Instructions.

Price, $3.00. (Add 25c. to prepay.)

Free—with encyclopedia—a supplement treating on the FORD, PACKARD & KING—part printed in two colors.

GAS, GASOLINE and OIL ENGINES



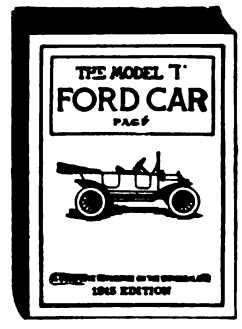
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Enlarged and Entirely New Edition of this Standard Work, Considers exhaustively all Types of Stationary, Marine, Motor Vehicles and Aerial Power Plants. 640 PAGES, With Folding Plates—435 ILLUSTRATIONS. Price, $2.50 Net.

THE MODEL T FORD CAR



Its Construction, Operation and Repair

By Victor W. Pagé.

300 (5 x 7) pages. Over 100 specially made engravings and two large folding plates.

Price, $1.00

This book is written for FORD DRIVERS and OWNERS, by a recognized automobile engineering authority and an expert on the FORD, who has driven and repaired Ford Cars for a number of years. He writes for the average man in a practical way from actual knowledge. All parts of the Ford Model T Car are described. ALL REPAIR PROCESSES ILLUSTRATED AND FULLY EXPLAINED.

Book Department THE COMMERCIAL VEHICLE 241 W. 39th St., N. Y. C.

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WEST'S "SLIPON" STEEL HUBLESS WHEELS

Fit Any Make Axle - Any Size Tire

They "Slip On" your wheel hub without effort or force—just as easily as wooden wheels. And once on—are good for the service life of your truck, not only eliminating all wheel trouble, but materially increasing tire mileage, a 25% increase in efficiency being not at all unusual. Lighter than wood.

Specially designed for light or medium trucks. Satisfaction guaranteed. Write for full particulars.

WEST'S Cast Steel Wheels are the oldest, most dependable, most successful in use. Over 35,000 in use.

We make a specialty of cleated steel wheels for "good roads builders" and road tractors, as well as cast steel wheels for railroad tread and wheels with removable flange for rail sections.

THE WEST STEEL CASTINGS CO.

Cleveland Ohio

Standard Hub Type Cast Steel Wheel for Pressed-on and Demountable Tires

New Hubless Type Cast Steel Wheel for Pressed-on and Demountable Tires

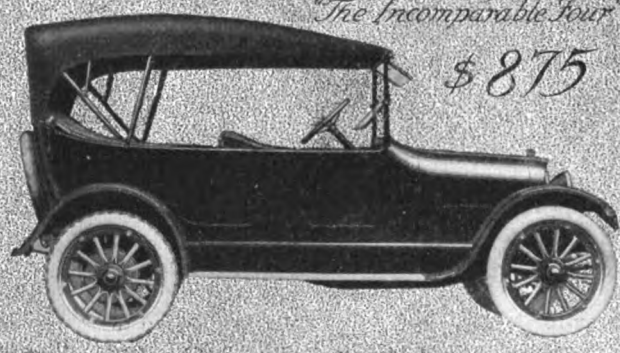
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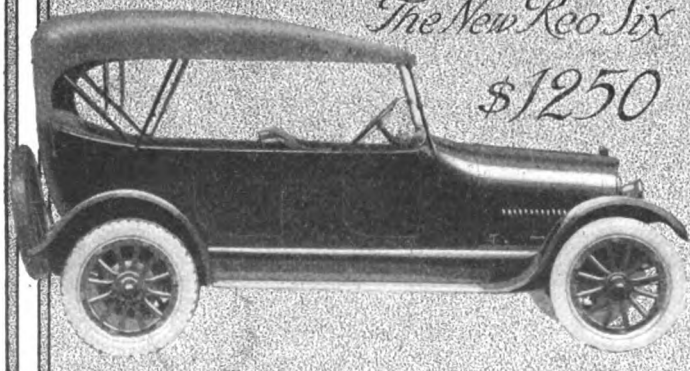
REO FACTORY FACILITIES~

REO

The New Reo the Fifth
"The Incomparable Four"
$875



The New Reo Six
$1250



All prices are f.o.b. Factory, Lansing, Michigan and are subject to increase without notice

The "Open Door" Shops—

IF YOU COULD VISIT US at Lansing and spend a day or a week going through this big 40-acre factory, you'd learn more about Reo quality than we can ever hope to tell you in Reo advertisements.

FIRST, YOU'D GET ACQUAINTED with us Reo Folk—and we think you'd say after a visit that this organization is sincere and earnest in its desire to make, not the most, but the best automobiles and motor trucks.

THEN WE'D SHOW YOU through the splendid Reo laboratories where the Reo chemists and metallurgists analyze and develop and finally test all metals that go into Reos.

THESE LABORATORIES are unsurpassed by any in this industry—excelled by few, if any, in the world, in point of equipment and thoroughness of results.

OF COURSE YOU'D MEET the Reo engineers and body designers; and you'd find them not poring over new models, but seeking to bring to a point still nearer perfection, those Reo models that are already standard.

THEN YOU'D UNDERSTAND what now is so difficult to credit—the wonderful longevity and the low up-keep cost of Reos.

PROPOUND ANY QUESTION you like to these engineers and in the reply you'll find food for thought—and you'll agree that Reo engineering is sound engineering.

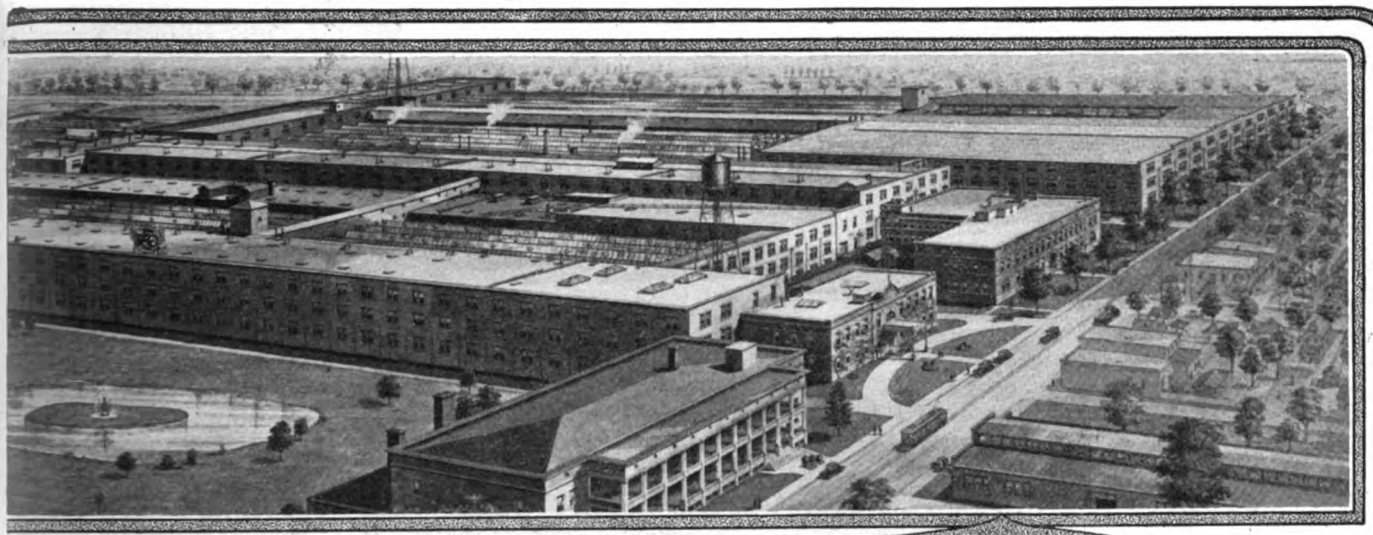
THEN IF YOU HAD TIME we'd take you through the entire plant—all units shown in the picture. It's about a 16-mile walk if you go down every aisle and see every operation.

AND EVERY FOOT OF THE WAY you'd find something interesting, something to approve—something that would indicate to you the quality that is Reo.

BUT IF YOU HADN'T more than a day to spend we'd show you only the major operations—

REO MOTOR CAR CO.

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THE BASIS OF REO QUALITY

You Are Always Welcome

and you'd see some modern miracles of manufacturing.

WE CANNOT IMAGINE a more profitable day, or a more instructive ten days, than you could spend here in the Reo plants.

FOR YOU'D LEARN not only how good automobiles and dependable motor trucks are made, but you'd appreciate as never before what tremendous strides have been made in the past few years in the allied sciences of metallurgy and of manufacturing.

COME ANY TIME—you are cordially invited. Make the visit whenever best suits your own convenience—for we Reo Folk are always here—always the same—and always glad to meet any Reo owner, prospective owner or dealer.

FOR, BY THE WAY, the Reo Motor Car Company is owned and manned by home folk—Lansing folk. No absentee directors control this business.

ANY PROBLEM, no matter how vital or how trifling, can be and is, decided right here—and on the moment. The directors can be called into conference in five minutes.

PERHAPS that's another reason for Reo quality, Reo success. We think so.

THE FIRST IS Good Intent. Then comes Experience—oldest in the industry. Next, Intelligence—we may modestly claim this in the light of our success.

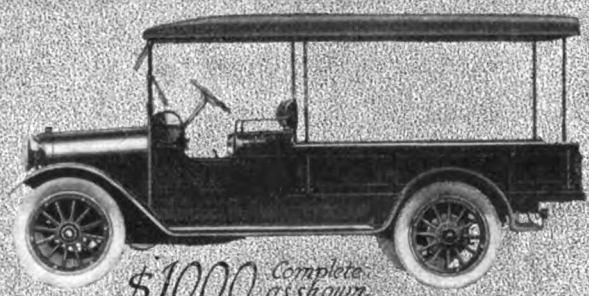
THEN FACTORY FACILITIES, second to none, which enable us to make every part according to the specifications and up to the standard set by Reo engineers.

AND FINALLY (or shall we reverse the order?) the fact that we can and do decide all questions right here and without red tape or delay.

COME AND SEE US. The latchstring is always out.

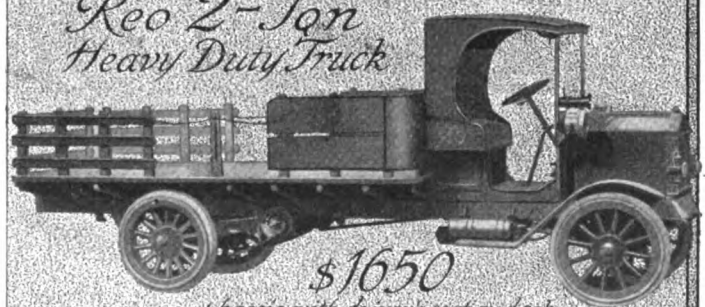
"THE GOLD STANDARD OF VALUES"

Reo 3/4-Ton "Hurry-Up Wagon"



$1000 *Complete as shown*

Reo 2-Ton Heavy Duty Truck



$1650
Chassis with driver's seat and cab

All prices are f.o.b. Factory, Lansing, Michigan and are subject to increase without notice

LANSING, MICHIGAN

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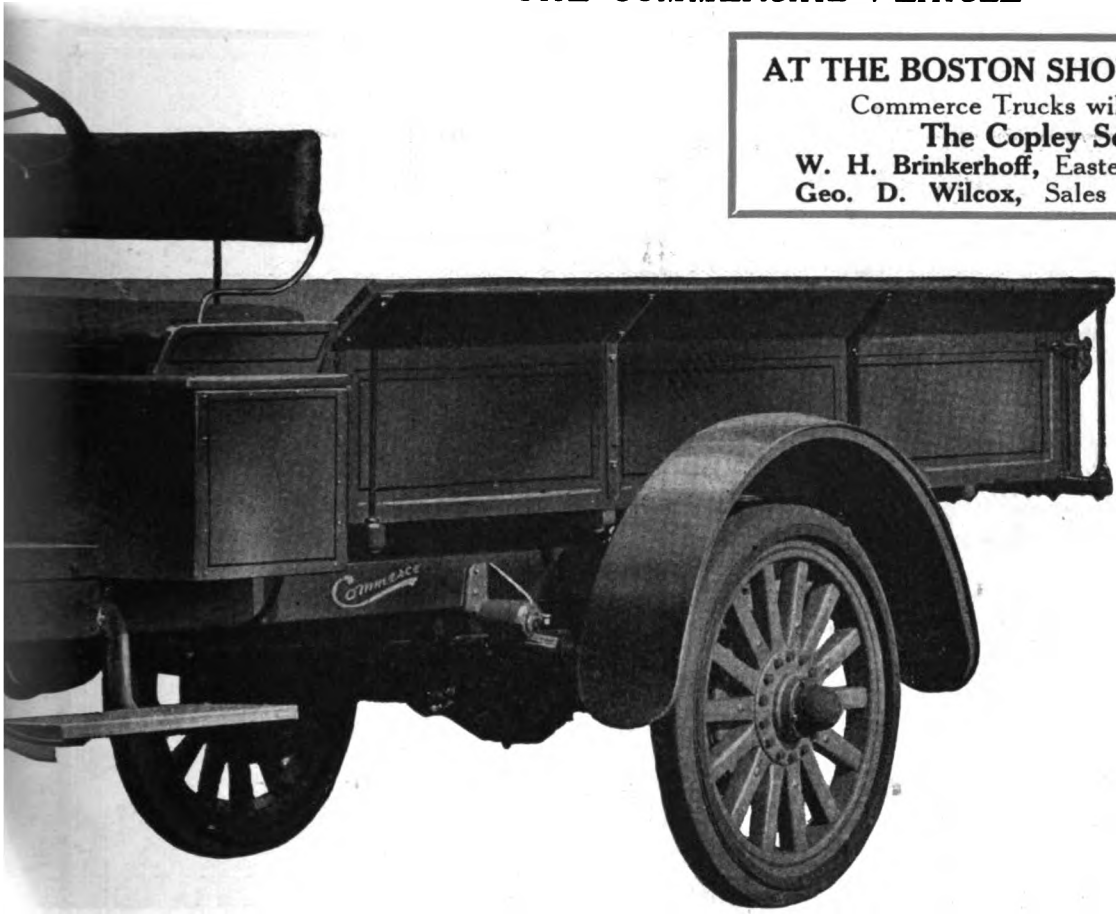
FAR IN ADVANCE
OF ALL COMPETITORS

Commerce

One Ton Completely equipped with Starting and Lighting System, Windshield, Stewart Vacuum System, Bumper, Pierce Governor and Open Express Body—Internal Gear Drive. **$1175**

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AT THE BOSTON SHOW, March 3rd to 10th,
Commerce Trucks will be on Exhibit at
The Copley Square Hotel
W. H. Brinkerhoff, Eastern Dist. Manager and
Geo. D. Wilcox, Sales Mgr., in Attendance



ALL ALONE—IN POINT OF EQUIPMENT

Some other trucks have self-starters—some have lighting systems—some have bumpers—

But the Commerce is the only truck that has ALL of these things (and several others, including windshield and spotlight) NOW—TO-DAY!

This is a big real advantage, for these things are *needed* on a truck, and are generally bought by the truck owner at *extra cost*—and he has to wait while they are put on.

Of course the Commerce has many other valuable selling points, as can readily be seen by glancing at the list of quality units below—and by looking up the actual performance of this truck during the last 7 years—

But this point of equipment is so evident—it shows so plainly the foresight and care exercised by the builders of this remarkable truck—that we are taking pains to call your attention to it.

This is not an argumnet—it is merely a statement of facts—there is no answer to it.

UP-TO-THE-MINUTE EQUIPMENT

Three types of Bodies—A Windshield—Remy Starting and Lighting—A Spotlight—A Bumper (Integral with frame)—Large Searchlights (with dimmers)—Stewart Vacuum System—Pierce Automatic Governor.

REAL QUALITY UNITS

Continental Motor—Torbensen Internal Gear Rear Axle—Cast Tank Radiator with Removable Core—Truck Type Roller Bearing Front Axle—Unit Transmission, special truck type—Detroit Steel Products Company Springs.

These, together with a special truck frame and fittings such as are usually found in a truck of 2-tons capacity, are the principal units that enter into the construction of the "Model E" Commerce 1-ton Truck.

DEALERS Commerce Dealers have it over their competitors "like a tent." They have a truck that is unbeatable in its class, and with this Big Advantage of complete equipment there is nothing to it. We still have a little room left for live, dependable dealers. Write us to-day.

¾-Ton Model, $975. Supplied with 3 types of bodies

Commerce Motor Car Company

DETROIT MICHIGAN

W. H. Brinkerhoff, Eastern District Manager, Belmont Avenue, Elmhurst, Long Island, N. Y.

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WARNER

GEAR COMPANY OF MUNCIE



Warner Truck Transmissions

A Mark of High Quality and Long Service In Any Motor Truck

TRANSMISSIONS · CLUTCHES STEERING GEARS · DIFFERENTIALS

WARNER GEAR COMPANY, Muncie, Indiana

Detroit Office, 967 Woodward Ave.

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Six Pierce-Arrow Trucks Move 102,550 Tons in 200 Days

Six 5-ton Pierce-Arrow Motor Trucks owned and operated by E. C. Humphrey, contractor of Hackensack, N. J. recently completed a big road building job on which they hauled 102,550 tons of material over distances ranging from 1,000 feet to 15 miles in 200 working days.

As in many contracting jobs, time was the essence of the contract. Frequently the trucks, working 24 hours a day, covered over 200 miles. A big asphalt making plant was located near Mr. Humphrey's Hackensack dock, and here all supplies were received with facilities for prompt and economical loading into the trucks.

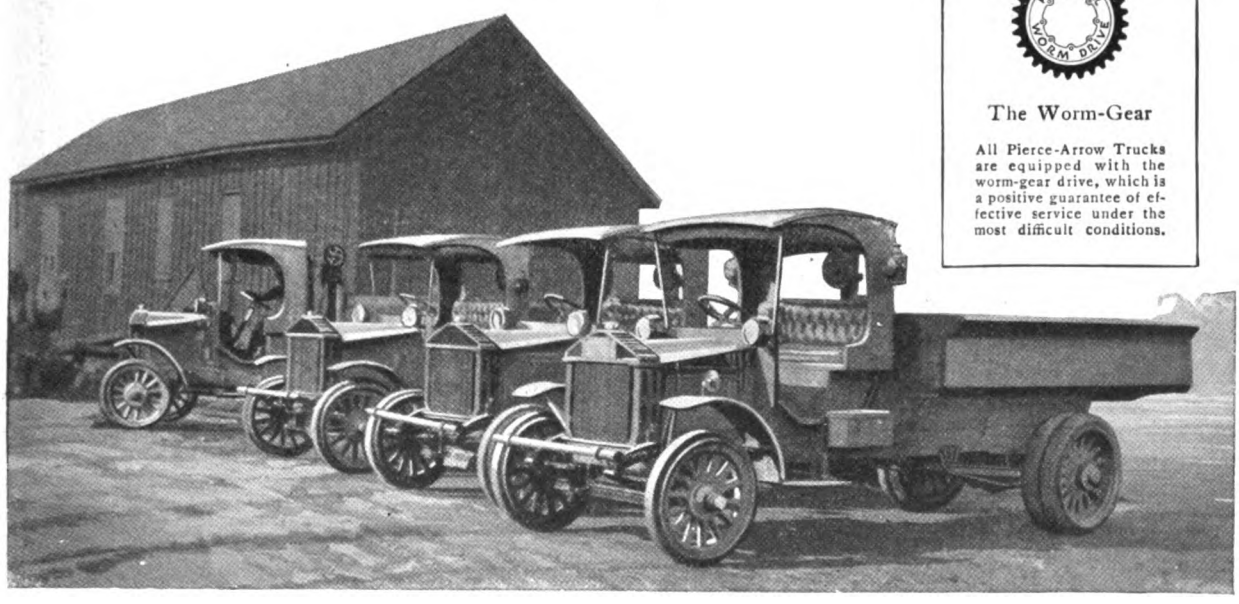
During the 200 working days the following materials were received at the docks and loaded into the trucks:

100 scows of sand and stone, averaging 900 tons each
4 loads of lime dust, averaging 400 tons each
9 boatloads of asphalt, averaging 400 tons each
6 boatloads of paving block, averaging 900 tons each
3 boatloads of coal, averaging 350 tons each
2 boatloads of paving block, averaging 450 tons each

Mr. Humphrey gives much of the credit for his success on big contracting jobs in many parts of the country to his Pierce-Arrow trucks, and says that he believes the Pierce-Arrow by long odds the best motor truck made.

A number of other interesting installations are shown in our booklet, "What Pierce-Arrow Motor Trucks are doing in the Contracting Business." We shall be glad to send you a copy.

THE PIERCE-ARROW MOTOR CAR COMPANY
BUFFALO, N. Y.



PIERCE
PIONEER WORM DRIVE

The Worm-Gear

All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

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The COMMERCIAL VEHICLE

THE editorial policy of COMMERCIAL VEHICLE interests the truck owner by keeping him advised of all new developments in the quest for the ultimate lowest-ton-mile-haulage.

It interests the Truck and Accessory Dealers by advising them of the newest and most valuable way and means for increasing sales and efficiently managing their business.

READERS

5,000 (plus) interested readers subscribers—read COMMERCIAL VEHICLE twice every month.

Most of them are just as much interested in the advertisements as in the editorial matter.

Truck Owners, Truck Dealers, Truck Salesmen, Truck Accessory Dealers and Jobbers are buying and reading it—more of them every issue.

CIRCULATION

This circulation is guaranteed—you **know** that the very people you want to reach will read your story. You have practically 100% of actual prospects.

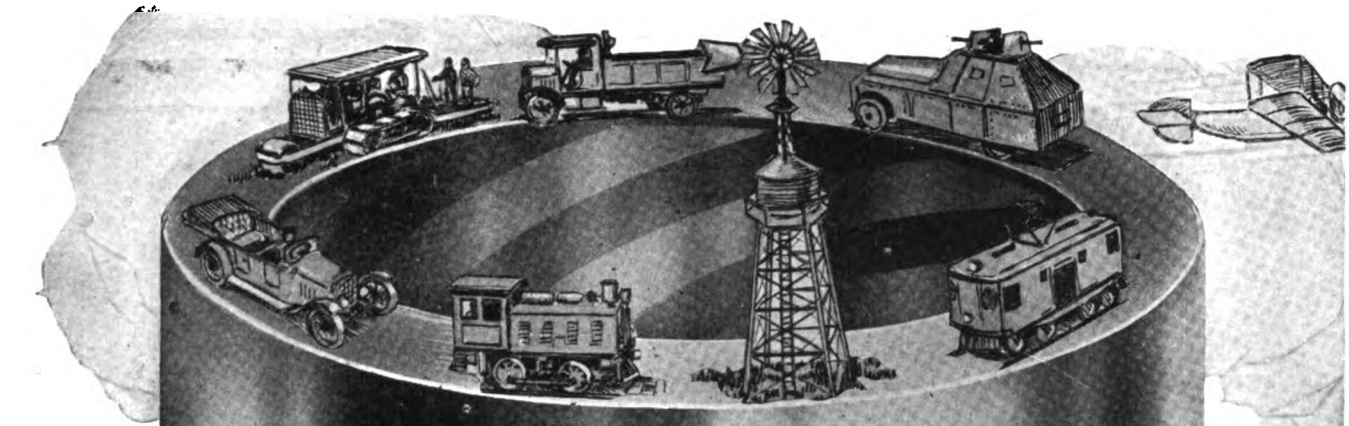
COMMERCIAL VEHICLE is definitely and permanently established with the trade and offers a medium to advertisers in this particular field that is unexcelled.

It offers a dollar-for-dollar value that is extremely attractive to advertisers

The COMMERCIAL VEHICLE

239 West 39th Street New York

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Trade Mark

BOUND BROOK

Reg. U. S. Pat. Off

"Graphite and Bronze"

Oil-less Bushings

BOUND BROOK "GRAPHITE AND BRONZE" OIL-LESS BUSHINGS are made of the finest bearing bronze, so designed and constructed as to retain lubricating graphite.

Equal to the ordinary bronze bushing in strength, these bushings are vastly superior in smooth, consistent service and wearing qualities. They are oiled for life when made, and need no attention whatever after installation.

Farsighted truck and pleasure car manufacturers are using these bushings in all parts of their cars where it is difficult or impossible to keep an ordinary bushing properly lubricated.

Bound Brook Oil-less Bushings are also used extensively in

Motor Boats, Street Cars, Tractors, Electric Vehicles, Harvesting Machinery, Aeroplanes, Tackle Block and Hoists, Concrete Mixers, Mining Machinery, Conveyors, Escalators, Battle Ships, Lighting Systems, Wind Mills, and Gas Engines, etc.

Bound Brook Bushings are made only "to order."

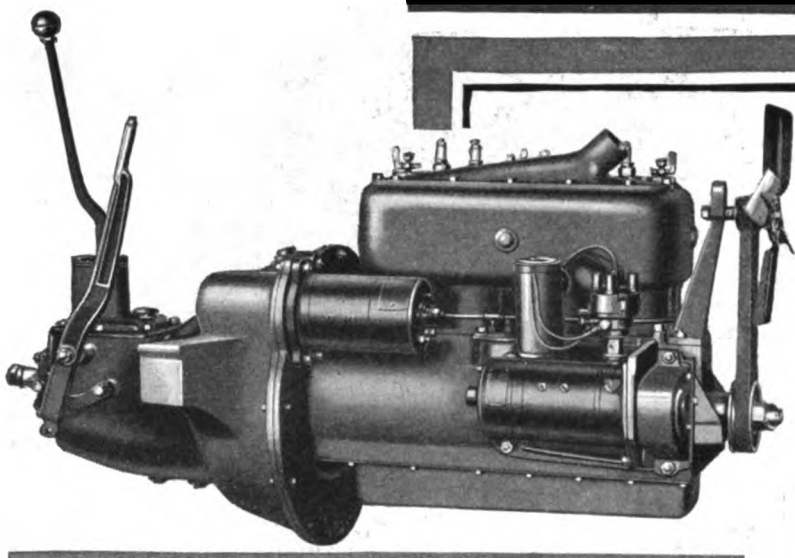
All genuine graphited oil-less bushings have always been made at Bound Brook, U. S. A.

Bound Brook Oil-less Bearing Co.

Specialists in the manufacture of oil-less bushings for more than a third of a century.

BOUND BROOK, N. J.

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Four Cylinders, 3¾ x 4¼ (22½ H. P. A. L. A. M.) 36.9 H. P. at 2800 r. p. m. Three bearings. All G. B. & S. Motors now provide for two-unit starting and lighting system only—operating through Bendix Drive,

Concentration —a bond to Quality

THE minute an engineer takes the time to investigate a G. B. & S. Motor, and give it a real test under trying conditions, that instant we begin to make a convert to the G. B. & S. **idea.**

And by the same token, the buyer who drives a "G. B. & S." Motor instantly appreciates the various distinctive advantages that result from concentration on one model.

He finds that though this motor is rated at 22½ H.P., it develops 36.9 horse-power.

Thus he has a flexibility of operation and range of speed at his command unique in four-cylinder motors.

He is impressed by the rugged design and the marked simplicity. He is pleased with the economy. He likes the accessibility of every part. He likes the easy method of adjusting the chains, insuring silence.

And he is delighted with the snap, verve and **powerfulness** of what he enthusiastically acknowledges is one of the best four-cylinder motors ever built.

By concentrating all our energies on this one type of motor, we virtually bind ourselves to produce a superior article—there is no other alternative. We accept the situation as it is and we leave it to "G. B. & S." users (increasing every season) to say whether or not we are delivering the goods.

For blue-prints and other information, write

Golden, Belknap & Swartz Company

Detroit, Michigan

G·B&S motors

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CO-OPERATION

GRAMM BERNSTEIN

Increased Selling Power

Suppose, Mr. Dealer, you have solicited an important truck prospect, a big order is hanging in the balance—you long for an "80 horse-power" salesman to help close the deal.

If you are a Gramm-Bernstein dealer, you have at your command the highest grade truck salesmen; members of our factory sales force, who are ready personally to assist our Dealers in closing sales.

Write us for a description of how we help Dealers locate prospects; how your prospects are circularized regularly every month from the home office; how our policy of local newspaper advertising permits you to be the best known dealer in your locality; how the G-B Statistical Department supplies comprehensive data, invaluable in aggressive sales work,—and many other unusual features.

Back of the Dealer's efforts—back of the G-B advertising and sales co-operation, is the repute of Gramm-Bernstein—to the average truck buyer pregnant with significance—a name that has behind it sixteen years of the brainwork of the master truck builder, B. A. Gramm.

Gramm-Bernstein gives you **the advantage of a full line,** (1 to 6 tons). Our agents can meet **any** requirements in a truck—perfectly satisfy every prospect.

And you enjoy the benefit of the Gramm-Bernstein sales policy—**the most profitable sales policy** ever put up to any ambitious man or firm.

Inquiries are being received rapidly and territory is being assigned rapidly. Write at once or telegraph. Action NOW will cost you nothing—it may mean big profits for you in a Gramm-Bernstein Agency.

Gramm-Bernstein Motor Truck Company
Lima, Ohio, U. S. A.

The Gramm-Bernstein Motor Truck Company.
13 Gramm Blvd.
Lima, Ohio, U. S. A.

Please send me complete explanation of your new sales policy on Gramm-Bernstein Trucks, including reasons why it will pay me to handle the line; the advertising you will do for me in my local papers; the Dealer Sales Service, etc.

Name .....

.....

Street and Number.....

City..... State.....

I { am / am not } representing a truck at the present time.

If you are representing a truck at present, please give the name of it here.

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MACK

The Truck that

¾ Ton $895

Note Strong Rear Axle

Motor—30 *H.P.* at 2000 *R.P.M.*
Transmission Special 35 *H.P. Type.*
Rear Axle ¾ *floating, Double Torque Tubes.*
Over-size Tires and Wheels 35 x 4½.

MACK

W. C. Mack, one of the founders of the famous Mack truck, is chief designer and builder of the Metropolitan Truck, here illustrated. He has made it strong and light—speedy and durable. Correct design and knowledge of metals make possible this extraordinary combination.

Filling exactly the field wherein the heaviest demand is felt, this truck is a quality job, a thorough job, a thought-out, experience-taught, genuine truck-builder's job.

Watch for our announce

Metropolitan Moto
220 W. 42nd Street,
Factory: 585-587

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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MACK Built

BILT

There is **nothing cheap** about this truck.

It is especially built to outlast, outwork and outsave the best of other light trucks.

And what **W. C. Mack** tries to do in this line, he does do —there is no doubt of that.

He built this truck, and he is willing that his reputation should stand on it.

It is the **masterwork of its** class—the very cream of the light truck field.

ent of our 1½ ton truck

s, Inc., New York
ew York City
ckson Avenue

DEALERS
(5% More)

WE WANT GOOD, responsible dealers to handle this truck.

IT IS A QUALITY JOB, and we want quality men to represent it.

WE WANT THE KIND OF MEN we can offer extraordinary attractions to, because we know they will be worth it—in loyalty and proper representation as well as amount of sales made.

IF YOU ARE THAT SORT, write and tell us about it.

IF YOU ARE IN SHAPE TO HANDLE IT, we can hand you the biggest truck sales proposition that is going out this year.

"A worth-while Discount," quick deliveries, and lastly—Factory Profit-Sharing—

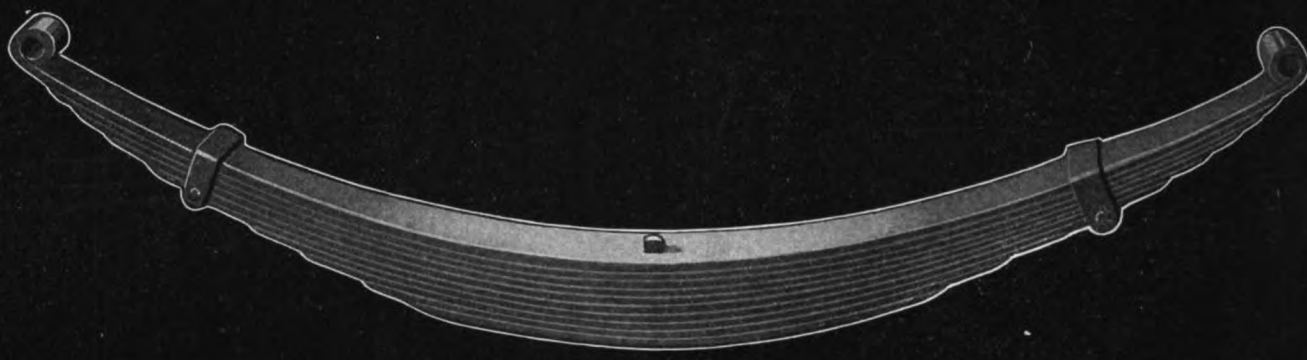
Don't delay—territory fast going—wire or write for "Confidential Dealer offering."

L. F. BOND, Gen. Sales Mgr.

BILT

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"The Spring Is the Thing"



MATHER

Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

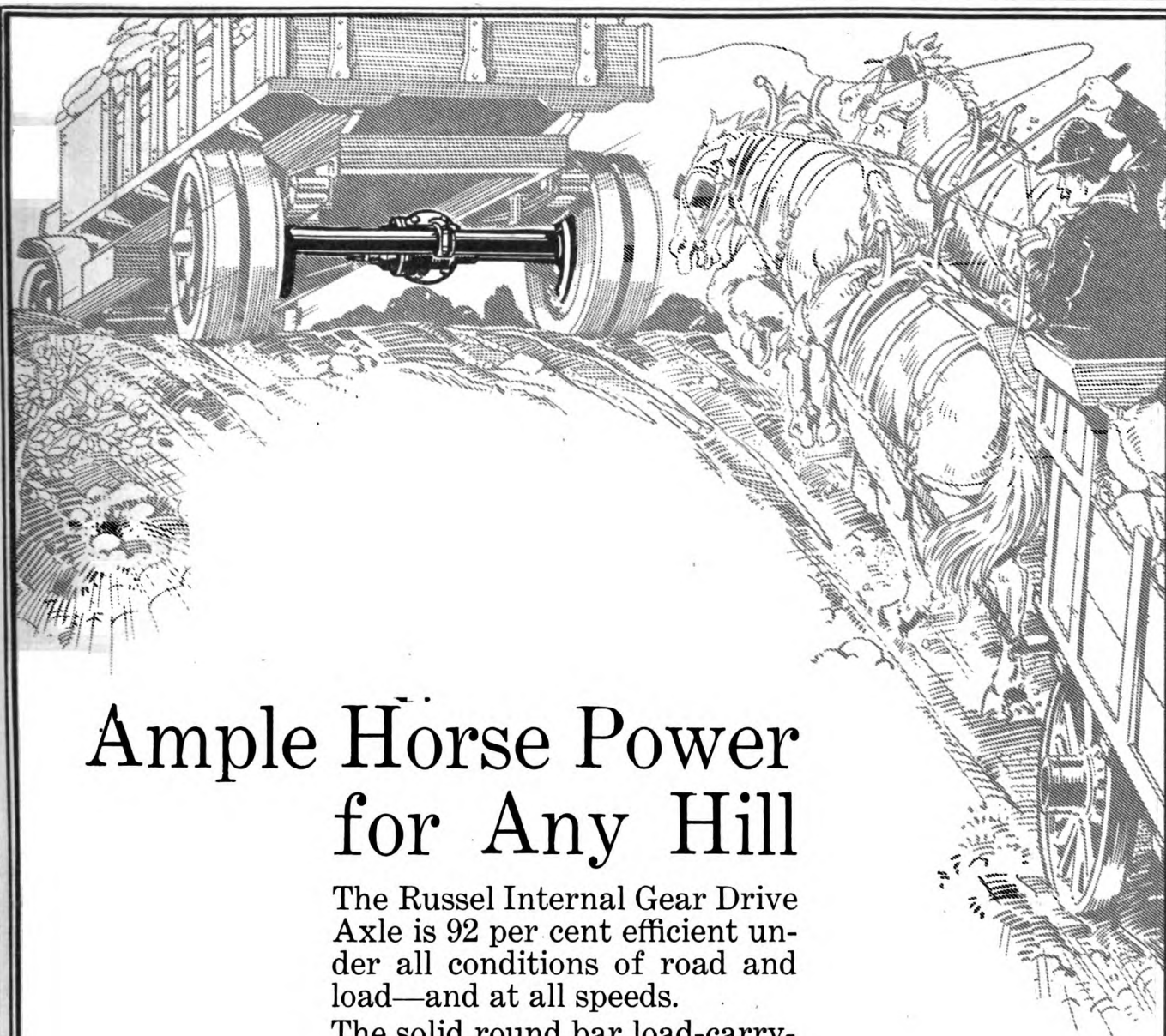
Minimum of Vibration

Genuine made only by

The Mather Spring Company

Toledo, Ohio

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Ample Horse Power for Any Hill

The Russel Internal Gear Drive Axle is 92 per cent efficient under all conditions of road and load—and at all speeds.

The solid round bar load-carrying axle takes care of the load while the drive axle delivers the maximum power near the rims of the rear wheels.

That is why the motor truck, equipped with the Russel Internal Gear Drive Axle, takes the steepest hill with comparative ease.

Can you ignore this fact in the purchase of your next truck?

Russel
Internal Gear Drive Axles

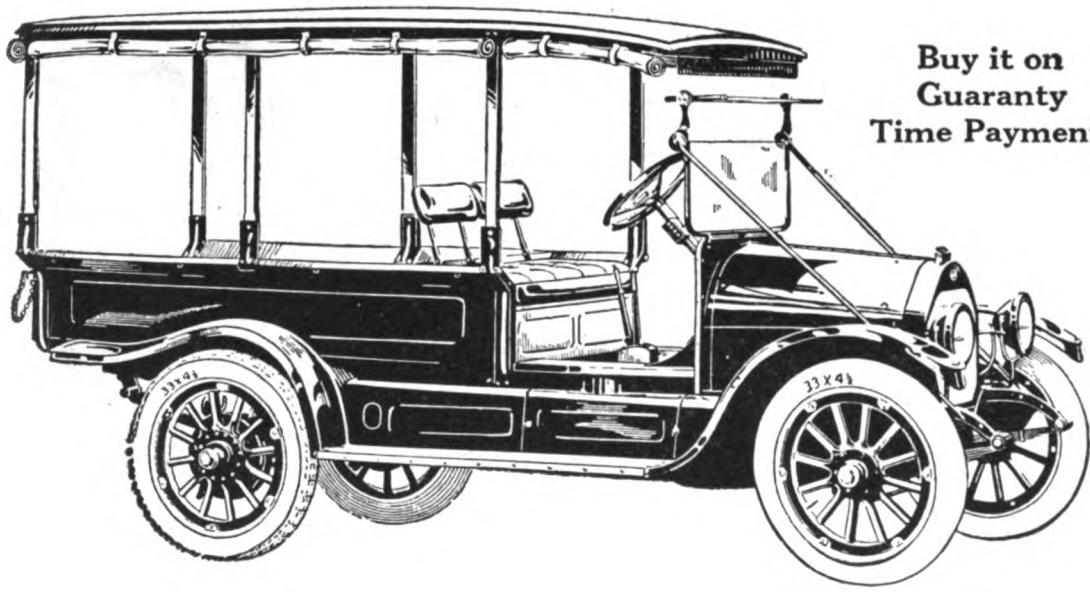
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Overland
TRADE MARK REG.

1200 Pound
Delivery Wagon
Express Type

$850

Chassis $800
f. o. b. Toledo
Subject to change without notice



Buy it on
Guaranty
Time Payments

Sell Your Horse and Get This Motor Delivery Wagon

Here is an Overland Delivery Wagon that will build up your business, better your service and broaden out your delivery radius.

Your horse and wagon will bring enough to make probably all of the first payment required to get this motor wagon at once on the Guaranty Time Payment Plan.

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The COMMERCIAL VEHICLE
Read by Business Men

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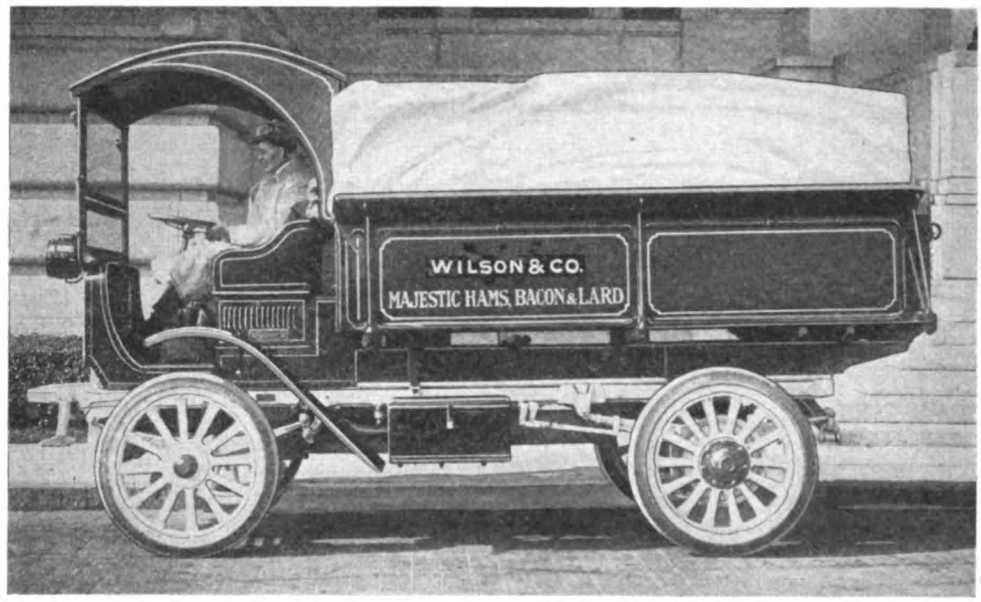
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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI March 15, 1917 No. 4

Boston's Largest Truck Show Proves Greatest Success

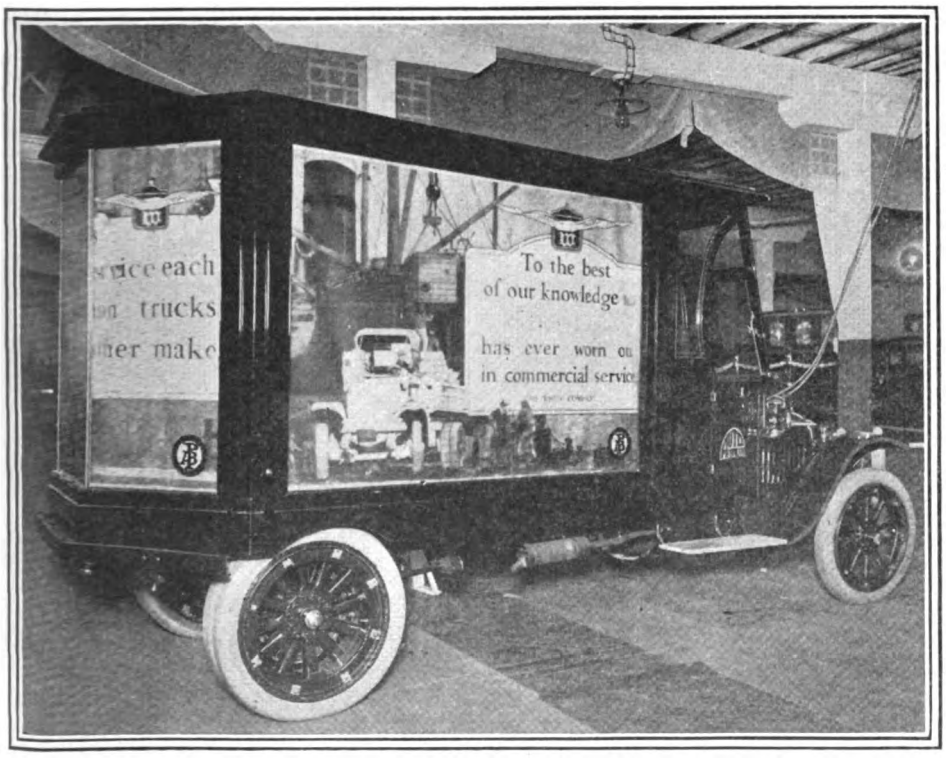
New England's Prosperity Responsible for Increased Show Business—New Bodies and Better Merchandising Methods Seen

PROSPERITY was the dominant note of this year's Boston motor truck show held in the basement of Mechanics' building from March 3 to 10. This prosperity was expressed first in the size of the show, which was the largest ever held in Boston, and second in the great interest shown in the truck exhibition and the amount of actual business done. All were indicative of the general prosperity throughout all New England during the past year.

For the first time it was necessary to requisition another building in addition to the old Mechanics' hall in order to accommodate those desiring exhibition space and even then some of the exhibitors complained that the show space was far too small. The additional structure secured was Horticultural Hall, a few blocks away. That hall is pitifully small when compared with the Mechanics' building, yet it was in Horticultural Hall that Boston's motor vehicle shows were held for many years.

This year's truck showings were larger both in the number of makes and the number of chassis on the floor than those in 1916 and even larger than the last exclusive motor truck show held in Boston in 1914. In all, thirty-nine makes were exhibited as compared with thirty-seven last year. This year's offering was made up of 121 vehicles, compared with one less last year.

Of this year's display, seventy-four of the trucks were equipped with bodies of some type.



One of the most novel trucks seen at the Boston Show, a 1½-ton White with a body having a glass end and sides. It will be put into service in the streets of Boston immediately after the completion of the exhibition as the latest type of advertising medium by means of which the signs are brought to the pedestrians instead of making the pedestrians pass the signs. The latter are painted on illuminated curtains inside the body, which are changed at 15-second intervals to register with the glass panels

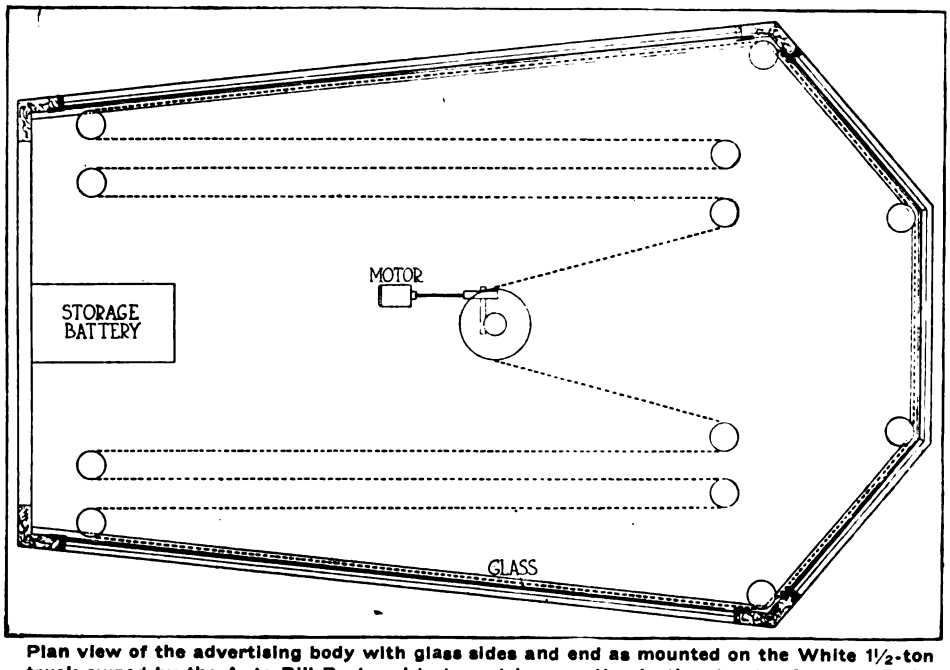
Coming Out for Débutantes

Last year eighty of the 120 vehicles shown were fitted with bodies so that this year's exhibits with bodies were slightly less in proportion than those of 1916. This may be explained by the fact that two brand new trucks, the Bethlehem and the Mackbilt, made by new concerns, were exhibited for the first time in addition to seventeen makes of older trucks which had never before been put on the New England show counter for the critical New England merchant to choose from.

Under such conditions it is but natural that the number of chassis was almost equal to those vehicles with bodies for the reason that the prospective purchaser is much better able to inspect the mechanical construction of the vehicle in the chassis than he is if it is covered and hard to get at by a body of any type.

The fact that seventeen new exhibitors put their trucks on show for the first time this year speaks well of the general prosperity of the New England territory, in which those exhibitors will

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Plan view of the advertising body with glass sides and end as mounted on the White 1½-ton truck owned by the Auto Bill Post and to be put in operation in the streets of Boston. The method of winding the curtains around disks supported from the body roof so that ten distinct signs can be employed is plainly shown, as is also the battery from which the current is obtained to register the signs with the glass panels. The curtains are hung on thin perforated metal bands moved by means of an automatic cam device driven from the electric motor through a pair of worms and worm wheels

have to sell their wares during the year. That they are basing their confidence to sell trucks in the New England territory on solid grounds is borne out by the fact that motor trucks have increased more than 76 per cent in the six New England states during the past two years. In Massachusetts alone, commercial vehicles have increased fourfold during the last five years.

New Englanders Need Trucks

New Englanders want trucks. They must have them. Many thousands of merchants from every one of the six New England states came to the Boston show to look over the entire offering. A larger percentage than ever before either bought trucks or made up their minds on those models they would order later.

Another indication of New England's prosperity was the fact that the attendance at this year's Boston show was approximately 50,000 greater than at any such exhibition ever held in the city. For the first time more than 275,000 persons squeezed their way into the Mechanics' building during the week.

As last year, this year's opening was ushered in by a regular down East snowstorm which later turned to a penetrating and most disagreeable rain. Monday and Tuesday were also rather poor attendance days. Yet the crowds which elbowed their way through the many entrances on Thursday and Friday nights were so large that all the available aisle space in the building was jammed and the management had to shut the doors for almost an hour on each night.

The doors were closed shortly after 8 p. m. and were opened again just before 9. During this interim those wishing to go out were allowed to leave, but none were permitted to enter until the struggling ranks inside had thinned out sufficiently to make progress along the aisles more of a pleasure than a problem. Although a similar procedure was followed out on one night during the 1916 show, this year's exhibition holds the record for making it necessary to shut the doors on successive nights.

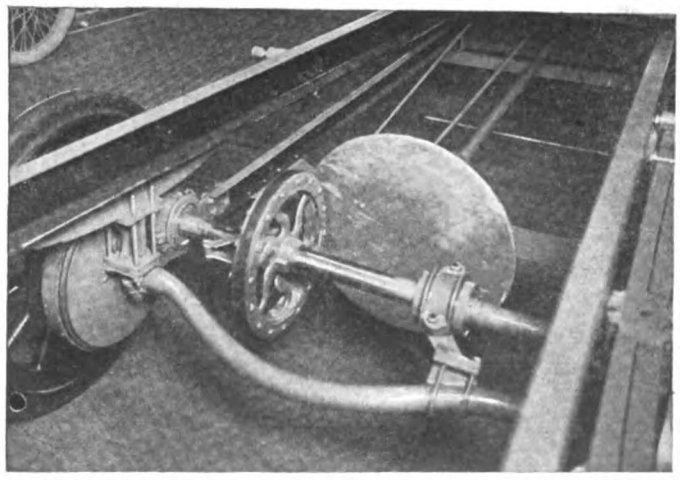
Many Sightseers Eventually Buy

While the great majority of the huge 1917 crowds came to look over the passenger cars, a greater proportion than ever before went downstairs to examine the commercial vehicles. On the nights on which the doors were closed, many of the spectators were actually pushed down the stairs into the basement where the trucks were shown because of the pressure exerted by those entering the show after them and their inability to find standing space in the crowded aisles on the main floor.

While many of these people were pure sightseers in so far as the trucks went, the truck exhibitors were quick to take advantage of the opportunity by pointing out the details of construction of their vehicles. They did this with the understanding that perhaps these same sightseers will be in the market for commercial vehicles next year or the year after and that a firm impression made this year might affect the sightseer's choice should he buy a truck before next year's show.

Many Prospects Secured

Aside from this somewhat pioneering work for the future, almost all of the dealers obtained many good prospects for the sale of trucks during the next few months. Practically all the dealers favor a combined show such as this year's and averred that they would be more than satisfied if next year's show

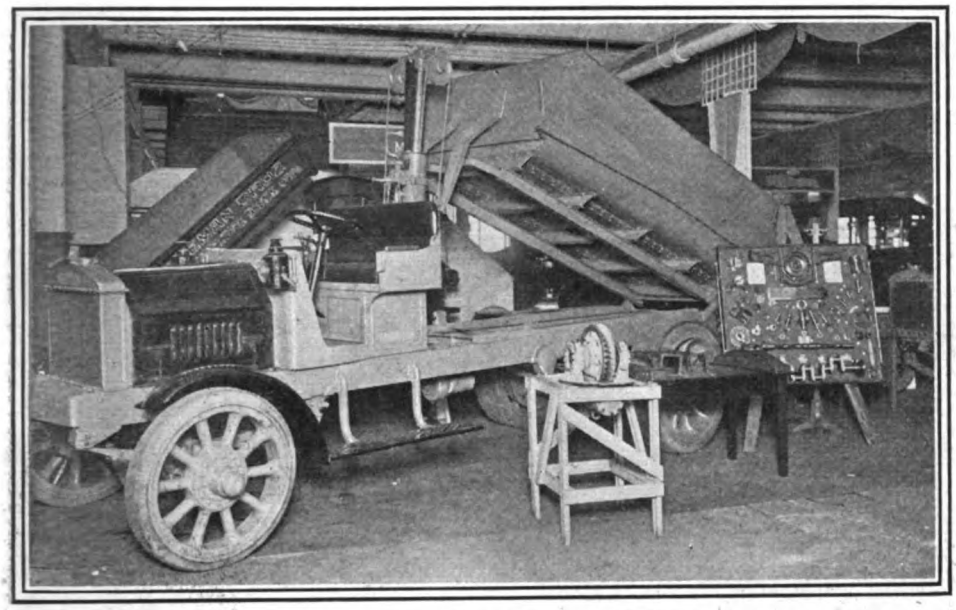


Rear view of the new Metz 1-ton truck, showing the friction-driven internal-gear rear axle which characterizes the vehicle from any other now actively offered on the market. The truck was shown for the first time and is principally distinguished by the internal-gear-driven rear axle as combined with the alloy steel driving plate contacting with a fiber-ringed driven wheel



The new ¾-ton Mackbilt as exhibited in the Boston overflow show held in Horticultural Hall, a few blocks distant from the main exhibition in the Mechanics building. The vehicle follows conventional design and is described and illustrated in greater detail on page 38 of this issue. It made its debut to the critical New England truck-buying public at the Boston show

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The new Federal 5-tonner in the foreground with the new 1-tonner in the background at the right, both exhibited for the first time at the Boston show, although the specifications of both models were given in full in the November 1, 1916, issue of THE COMMERCIAL VEHICLE. The new 5-tonner is characterized by the use of a new type of motor built especially for it, by Smith steel wheels all around, and a four-speed instead of a three-speed gearset. The new 5-ton model, together with the new 1-tonner and the 1½-, 2- and 3½-ton Federals, are described in greater detail elsewhere in this issue

should produce the same proportionate increase in business as this year's show did as compared with that of 1916.

At the moment New England's prosperity is best told by the potato situation in Maine. There King Potato rules supreme. Farmers in that state are hoarding potatoes like diamonds. They are even gambling in potatoes instead of money. They are swapping potatoes for passenger cars and paying off mortgages by the excess profits secured because of the tremendous increase in price of the homely spud.

Yet if conditions continue, they will be swapping potatoes for motor trucks if they want to sell their potatoes at all.

The present shortage of freight cars in the entire New England section has made it increasingly difficult to ship food products to the large rail centers and motor trucks have stepped in and solved the problem by delivering over the roads direct to the wholesaler in the nearest large center. The service which trucks have rendered in this work has been much quicker than could have been obtained in normal times from the railroads and immeasurably more satisfactory now when it sometimes takes 3 or 4 days to get a freight car from Lowell to Boston, 40 miles away.

Many Trucks in Overland Hauls

Many of the trucks sold in New England during 1916 have gone into the overland haulage service, carrying not only food products, but raw and semi-manufactured goods between industrial plants located within a radius of 75 miles from Boston. Many examples of such use of trucks are shown in the large map on page 21 together with the routes traversed by the vehicles between one city or town and another. A large number of the trucks which will be sold in the New England territory will undoubtedly go into overland haulage work and many will remain permanently in the service even should the freight conditions improve due to a cessation of hostilities abroad or a fuller resumption of the maritime trade of the world.

An Era of Confidence

But war or no war, New England's prosperity is bound to continue during 1917 because she manufactures products which will be just as much in demand in this country as abroad. Her agricultural products are required in the congested territory comprising the many large cities along the Atlantic coast. Her shoes, hats, leather, hardware and various miscellaneous manufactured articles are in great demand and this will continue, both in this country and abroad, if not for war purposes, for the period of reconstruction which is sure to follow.

The spirit of optimism is abroad in New England due to these causes. It was manifested at the Boston motor truck show first by the large number of new makes of trucks shown and second by the extra large attendance and the great interest which the showgoers exhibited in the commercial vehicles displayed.

Among the brand new trucks made by recently-formed companies were the Bethlehem and the Mackbilt, the latter exhibited in Horticultural Hall. In addition to these two, the new Metz one-tonner was shown for the first time along with the Metz passenger cars. The new Maxfer 1-ton truck was also exhibited, not in the show, but in the salesrooms of the company almost opposite the Mechanics' building.

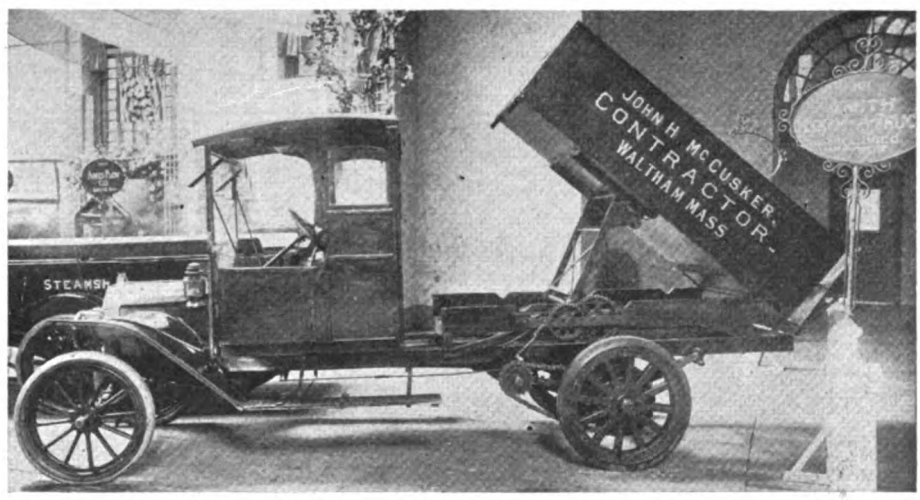
New Models Revealed

Aside from the four new chassis mentioned those trucks shown for the first time at a Boston show included the Atlas, Atterbury, Brockway, Duplex, F. W. D., G. M. C., Hurlburt, Gramm-Bernstein, Krebs, Rush and Stegman.

The older makes of trucks which were shown in new models were the Federal and the Selden. Three of the five new Federal designs described and illustrated elsewhere in this issue, made up the display of the Federal concern. Those shown included a 1-ton stripped chassis, a 2-ton chassis with a cab and a 5-tonner equipped with steel body and Wood hydraulic hoist. It was intended to show the complete new Federal line because the first Federal truck made was sold to the Whitten-Gilmore Co. Cambridge, Mass.; Manchester, N. H., and Hartford, Conn., were the cities in which the next Federals went into service, but the lack of available exhibition space made this impossible.

The new Selden model shown was the 1-ton internal-gear-driven model selling at $1,385. This vehicle was described and illustrated in the March 1, 1917, issue of THE COMMERCIAL VEHICLE.

(*Continued on page* 18)



Especially adapted for small jobs in hauling sand, cinders, cement and the like, the Ford car converted to a 1-ton truck by means of a Smith attachment and shown above is fitted with a 44-cu. ft. dump body raised and lowered by means of hand gearing. The truck owner, John H. McCusker, a contractor of Waltham, Mass., uses it on small contracting jobs where a larger truck would have to make the out runs with a very small percentage of its capacity loads. The body will hold 1½ cu. yd. of material and may be elevated to an angle of 50 degrees in less than 1 minute

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Only Exclusive Motor Truck Show
Proves a Big Success From Retail Standpoint



The Exhibit

Thirty-four Exhibits of Motor Trucks

Five Exhibits of Fords and Adapters

110 Truck Chassis

Four Manufacturers Participated

PRACTICE beats theory every time if one is to moralize from the experience of the truck dealers in the Metropolitan district in holding an exclusive truck show in Brooklyn. After having killed the truck show entirely in Greater New York and having only half-heartedly exhibited them in Brooklyn as a sort of passenger car side-show, they suddenly decided to stage an exclusive truck exhibition a few weeks ago, and with very little preparation and certainly with little confidence, they opened the first exclusive truck show in New York in 5 years and the first one in the country since 3 years ago.

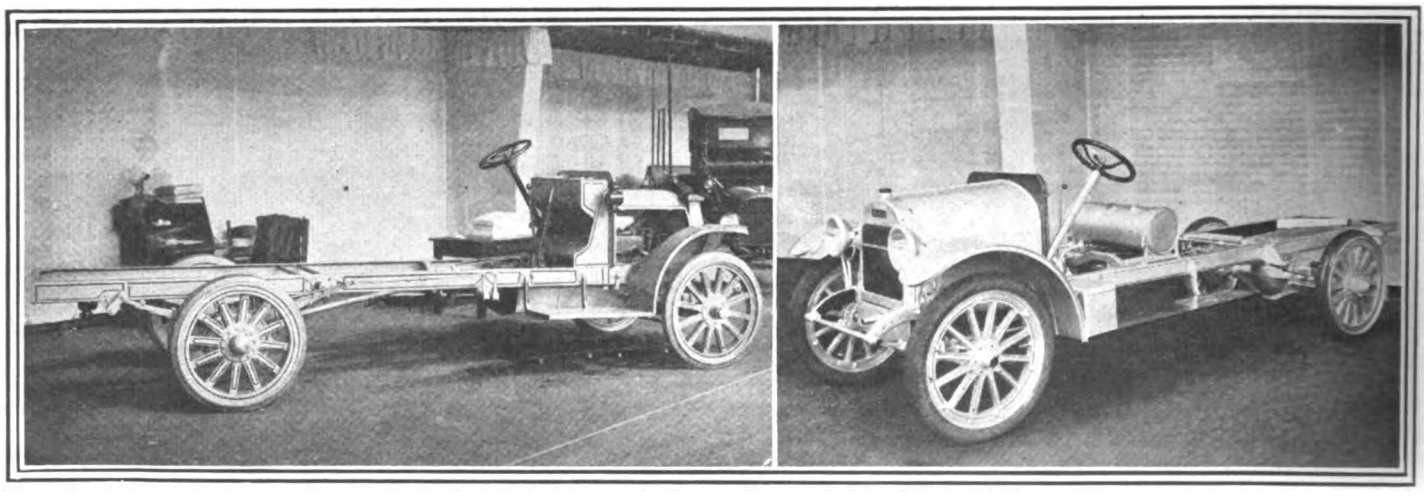
It wasn't intentional, but this show proved to be the most representative exhibit of commercial vehicles ever staged. In a single year the Brooklynites led the dealers of the greater city to a position of almost equal prominence in point of chassis exhibited as that occupied by Boston, when Boston held its biggest truck show. Taken by surprise, undoubtedly, these dealers have not failed to catch the point, and to-day the sentiment is almost unanimously in favor of a repetition of the event on an even grander scale next year.

These dealers were nearly all predicting failure for their own exhibits, a month or so ago, but now that they have something besides assumption to go on, now that they have tried the thing out, it would be strange indeed if the manufacturers, too, did not heed the lesson so plainly enunciated.

Although called a Brooklyn show, the exhibit was more nearly a Metropolitan district show, for it is the only one to which buyers throughout the Greater City, northern New Jersey, Long Island, southeastern New York and southwestern Connecticut may go. There were more exhibitors from New York City proper than from Brooklyn, there being twenty-five from Manhattan Island, ten from Brooklyn and two from elsewhere.

That the show was not entirely retail in nature is shown by the fact that there were four manufacturers' exhibits, namely, the Hurlburt Motor Truck Co., the International Motor Co., the Locomobile Co. and the Rainier Motor Corp. Of the rest of the exhibitors, twenty-one were dealers and nine factory branches.

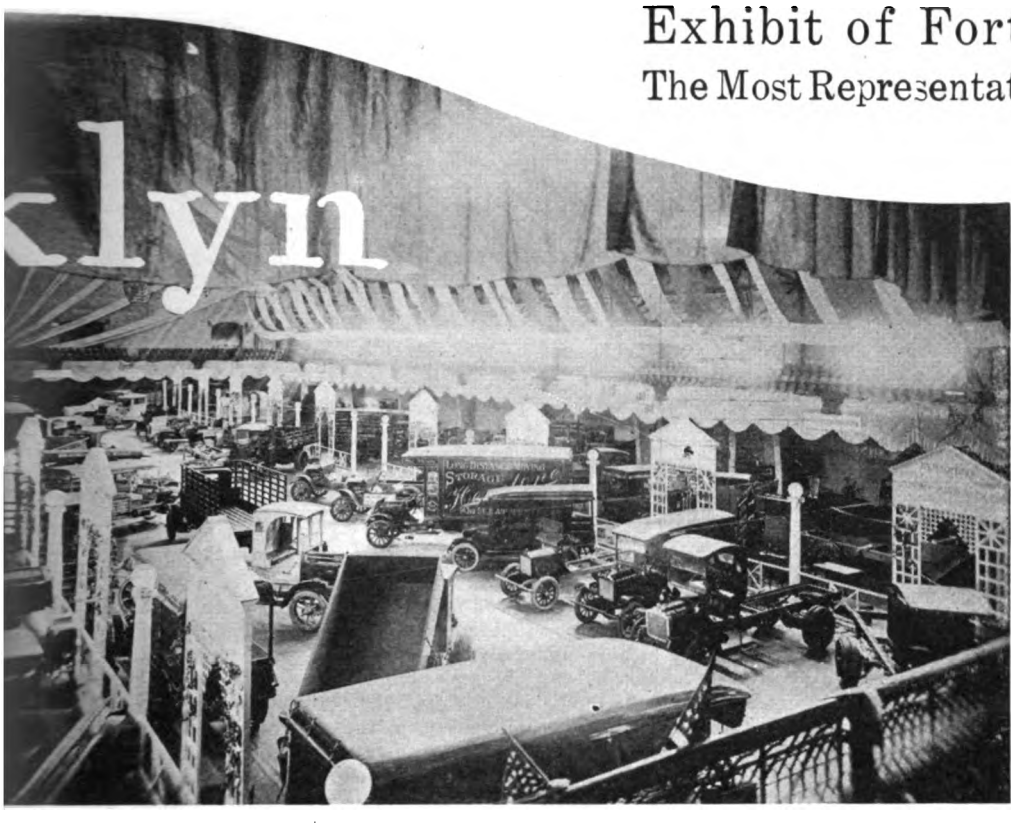
Comparison of this year's Brooklyn truck exhibition with those of previous years is difficult. In former years commercial models were exhibited in conjunction with passenger cars, the former occupying such space at the back of the hall as was left when the passenger models had been accommodated. Twenty



Two of the newcomers which made their debut at the Brooklyn show. At the left is the Fulton, and at the right the Maxfer. Both are 1-tonners, the Fulton having internal-gear drive and the Maxfer worm drive

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Exhibit of Forty Truck Makes is The Most Representative Exhibition Ever Held



Its Results

Estimated Attendance 25,000

Nearly 5,000 the First Night

Voted a Success

A Greater Truck Show Planned Next Year

chassis were shown last year, representing seven different makes. This year, in number of makes, even the Boston show was exceeded, there being forty represented besides five other exhibitors of Fords and Ford adapters.

There were 110 motor truck chassis on view besides fire apparatus, sixteen Fords, some with commercial bodies and some with adapters, one Dodge with a truck attachment and three truck adapters not applied to chassis, or a total, exclusive of fire apparatus, of 127 vehicles for commercial purposes.

There were thirty-four exhibitors of commercial vehicles, some of these representing two or more makes. One of these showed trucks of three makes besides one Ford adapter. This was the Broadway Motor Truck Co., of New York City, showing the Armleder, Collier, Sullivan and Kelley adapter.

Every one of last year's exhibitors appeared once more in the show just closed excepting the Buick company, which has discontinued its commercial models. Five new makes were revealed as well as several new models. The new makes were the Collier, Dodge, Fulton, Maxfer and Rainier. In addition to these, the U. S., Armleder, Larrabee and D-E were new to this section of the country.

New models included two of the new Federals, the complete line of which have been changed; one of the new Garfords, which have undergone several important improvements; the new six-cylinder Hurlburt of 7 tons capacity, the new 1,200-lb. Overland all-steel delivery vehicle, the Heavy-Service Packard 5- and 6-tonners, the Dispatch model, ¾-ton Republic, the internal-gear-driven 1-ton Selden and a new 1½-ton worm-driven Sullivan.

One outstanding feature of the show was the high percentage of genuine prospects, Except for the opening night there were practically no sightseers among those present. Thursday was especially set aside as vehicle-traffic night and Friday as retail grocers' night. These special evenings attracted groups which might not be immediate buyers, but were nevertheless interested in the development of the commercial vehicle and hence not to be classed as curiosity seekers.

The total attendance is estimated conservatively at 25,000. The show was accordingly voted a success by all present, as out of that number were secured a large number of prospects for each exhibitor. A census of the booths showed an average of at least 50 prospects per exhibitor. Undoubtedly in many cases several exhibitors had the same pros-



The Dodge exhibit, made by the Brooklyn dealer. This showing at the Brooklyn show marks the entry of the Dodge company into the realm of commercial vehicles. The chassis are the same as the passenger models

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pects. The actual results are shown more clearly by the fact that one firm sold seven trucks at the show, another sold six, and sales of five or more were reported by many exhibitors.

It is true that many of these sales were to prospects who had been worked on somewhat before the show opened. Nevertheless the occasion gave the buyer a chance to look around extensively and hence made it possible to close the deal in short order.

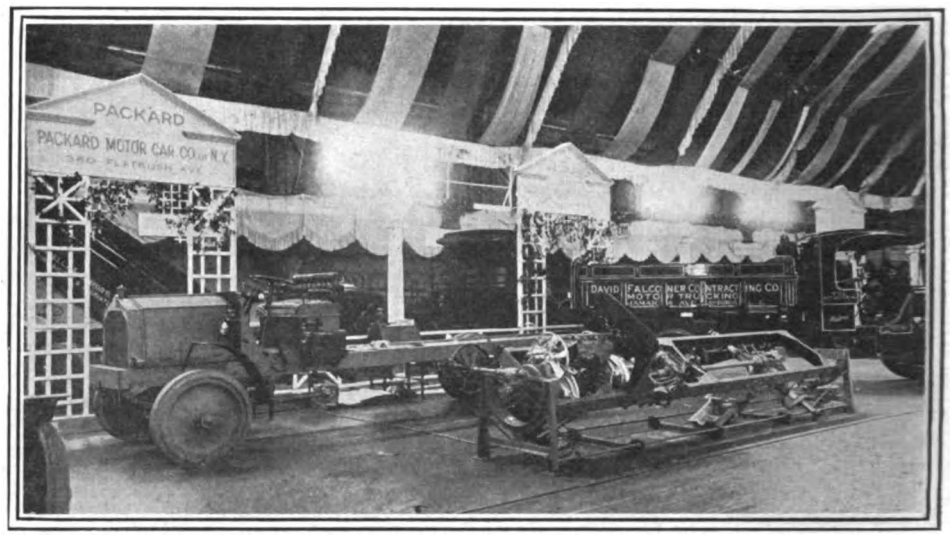
Show Was Accidental

Fortune favored the show. In the first place it was held as an overflow of the passenger car exhibition and was not therefore independently featured. If the passenger car dealers had not taken all the space at the earlier show, the exclusive commercial vehicle exhibit would never have been attempted. It was a sheer experiment, dubiously entered upon, but it turned out that the public was interested. The weather helped considerably, as some of the best days of the year to date came during that week.

On Tuesday evening, when the show opened, everyone was in a sceptical frame of mind. By 11 o'clock nearly 5000 persons had entered the gates, many prospects were on the books, and the affair was well under way. Thursday and Friday were big attendance nights, and the sales continued to roll up as the week progressed. Afternoon sessions were held from noon on during the last 4 days. The afternoon attendance was very light, but the dealer had time to take care of each prospect, and a fair percentage of sales was put through in the afternoon periods.

That nearly half of the chassis exhibited were stripped shows two things, first, that the impulse to exhibit was in many cases a hurried one, so that special efforts to secure interesting bodies, or indeed any sort of bodies, were not possible in many instances and, second, that the buyer takes a real interest in mechanical details.

Particularly noteworthy were the several devices employed to call the buyer's particular attention to the mechanical features of the chassis. Packard had an elaborately cut-away chassis mounted on two swinging supports at either end, so that by turning a hand-wheel the entire chassis might be swung on its longitudinal axis to afford a view of its various parts. The turning was accomplished by a steering gear at the front, the hand-wheel being a regular truck steering wheel. An electric motor was belted to the crankshaft to keep the parts in motion, but unfortunately it was not possible to have this in operation.



Packard showed its new heavy-service models and one of its trucks on a tilting stand

The Dodge chassis was also cut-away and a 1-ton Republic chassis was so polished in every detail that one was reminded of the Hotel Astor Salon.

A Retail Show

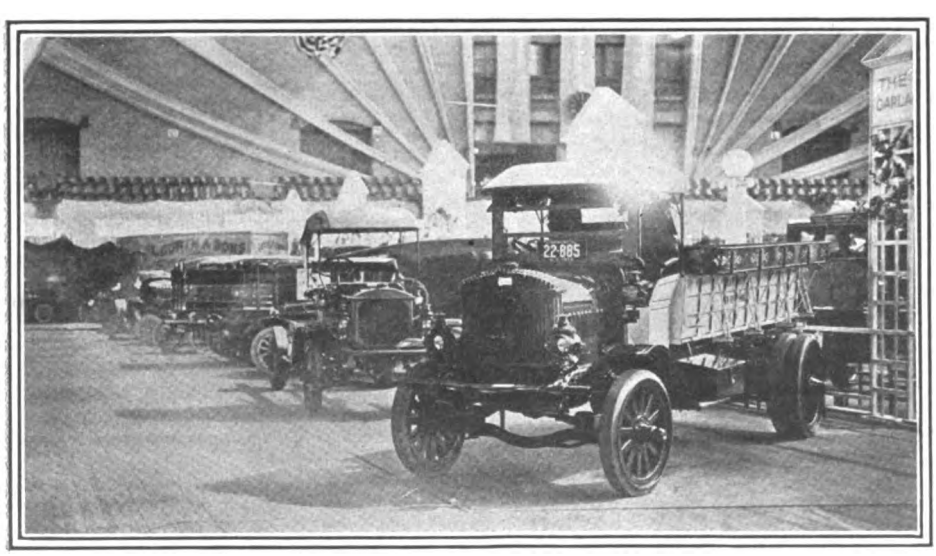
It was a retail show. The event was organized by Brooklyn dealers to stimulate sales by advertising their products and lining up new prospects. It is probable that the show will have a national scope in 1918, and the manufacturers have been shown the advantages of an exclusive commercial vehicle exhibit, but the attention this year was centered exclusively on the retail buyer.

Because of the somewhat casual origin of the show there was little planned in advance in the way of get-together meetings with the result that it was pretty much an each-man-for-himself affair. A distinguished banquet, however, in the interests of better highways took place at the Hotel Bossert, Brooklyn, Monday evening, March 5. Borough President Pounds, Public Service Commissioner Travis H. Whitney and other prominent men were among the speakers. Many commercial vehicle and passenger car men attended this event. A committee of fourteen, headed by Herbert L. Carpenter, was appointed to work for better traffic conditions.

Robert C. H. Rupp, president and general manager of the Maccar Truck Co.; Fred J. Wells, of the Pierce-Arrow truck service department; Millard Newton, advertising manager of the White Co., and M. Bernstein, of Gramm-Bernstein Co., were among the factory representatives at the show.

Novelties appearcd in the form of one of the Federals which went to the border, back in apparently good trim after the long campaign of strenuous watchful waiting with Squadron A, Cavalry, N. G. N. Y. There was also a little Ford, exhibited by the Twenty-third Regiment, N. G. N. Y., in whose armory the exhibit was held, which had seen some strenuous service in the southland.

In the Maccar exhibit was the Mueller demountable power plant, one of these being mounted on a special stand to show how completely the power and control units had been assembled for instant removal and substitution in case of trouble.

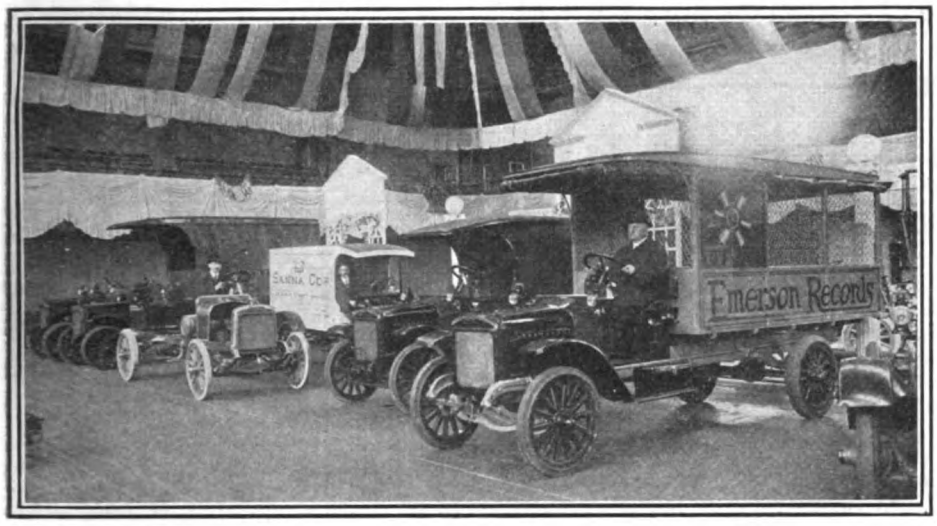


Local appeal was made by a 3½-ton Velie with a Long Island market gardener's body

The Artistic Appeal

Studebaker showed a panel body of exceptional beauty, being finished entirely in white enamel, with gold raised lettering on the side. It was mounted on white wire wheels, a spare one with a tire being carried at the side. Not less beautiful was a Dodge, enameled a delicate lavender and lettered in graceful script with the name of a prominent New York florist. Bad judgment was shown in the arrangement of some ex-

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One of the largest exhibits was that of the Republic

hibits, one dealer piacing a motor hearse in the most prominent position, so that it met the gaze first of every person entering the main hall.

Ingenious bodies of several sorts were on view, and these will be discussed more fully in a later article.

In point of size, Republic and White shared the honors, each having six chassis. The advantage, perhaps, goes to the White company inasmuch as there was a large fire hook and ladder truck by this house in the corridor. Reo, too, if one includes fire apparatus, deserves recognition because besides four commercial models two chemical trucks were shown.

In addition to this tabulation, a more complete listing of the exhibits will be found in the table on page 19.

Many Fords Exhibited

A feature of prominence in the Brooklyn show was the large number of Ford commercial vehicles, both the simple model T, with a delivery body and the more elaborate converted types.

Ford chassis with commercial bodies were exhibited by the Kohn Delivery Contracting Co., the Curth Auto Sales Co. and the Ford Delivery Car Co. Adapted small car chassis and Ford adapters were shown as follows:

Dearborn-Ford, Dearborn Truck Sales Co., 1½-ton express and separate attachment.

Dearborn-Ford, Overfield Auto, Inc., 1-ton piano truck and chassis.

H-D-Ford, Hayes-Diefenderfer Co., ½-ton panel, undertaker's, panel with half cab doors, panel with closed cab, open express and stripped chassis.

Kelley-Ford, Broadway Motor Truck Co., 1-ton chassis.

Maxfer-Ford, Nickerson & Schroeder, 1-ton chassis.

Smith Form-A-Truck-Dodge, Bishop, McCormick & Bishop, 1½-ton truck.

Tonford-Ford, Curth Auto Sales Co., 1-ton chassis and stake truck.

Truckmobile-Ford, Ford Delivery Car Co., 1-ton chassis.

A novelty was a lady salesman employed by the Hayes-Diefendefer Co.

A number of accessories were exhibited and an interesting new truck body. The latter was the McDermott body, built by the McDermott Body Corp., Long Island City, L. I. This body, which will be described in detail in the body article which follows in a later issue, is of the knock-down type, having a standard platform to which may be applied any number of interchangeable sides and tops on the sectional-bookcase plan. A variety of different sorts of side panels, stakes, etc., were exhibited which were interchanged at will by Mr. McDermott and an assistant.

New Accessories Shown

Among the accessories was a new tire chain called the Putnam armor chain, applied to a D-E truck. The new A-1 rim tool manufactured by the Rynehart Rim Tool Co. was exhibited by the Kinnear Sales Co., Brooklyn, N. Y. The Y. M. C. A. had an exhibit of its motor school, a sample engine on a block being used to illustrate the manner in which instruction is given.

Other accessories were hydrogas, an attachment to the radiator by which live steam is introduced into the manifold; the Marko storage battery for lighting and ignition, the A. B. C. electric starter for Fords, and the H. & N. carbureter.

An exclusive motor truck show will be held in Greater New York next year. The opinion of all the dealers was practically unanimous on this score. It is altogether possible that such a show, however, will be held at Grand Central Palace, possibly after the passenger car, possibly early in March. On the details of the time and location of the next show there is wide difference of opinion.

For a Gotham Show

Several of the big distributors believe that a show in New York would tap a larger area, and certainly it would be more convenient to a larger number of prospective purchasers. It would draw more readily on New Jersey, Connecticut and the Hudson River counties. Those who favor Brooklyn, however, point out that a New York show would be an experiment, whereas it has been established that the show is a success in Brooklyn.

The Twenty-third Regiment Armory is accessible by elevated train connecting with the subway to Manhattan and all parts of Brooklyn; furthermore, it is near the Nostrand Avenue station of the Long Island Railroad, which taps the big market-garden interests in that territory.

Location of Minor Importance

The crowning argument which the pro-Brooklynites use is that the show drew from all parts of the Metropolitan district this year. Visitors came from New Jersey, Connecticut, Long Island and all parts of Manhattan. Nearly every dealer, however, agreed that since the show had at least made expenses, since it had closed some sales and developed many others, it would be well to hold it again in Greater New York next year. The exact location is a comparatively minor detail.

DETROIT GAUGE BUYS RETLAW PLANT

DETROIT, March 5—The Detroit Gauge & Metal Stamping Co. has been incorporated for $50,000, and assumes the entire business and plant of the Retlaw Mfg. Co., maker of gasoline gages.



The White exhibit was crammed with interesting trucks

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Initiation vs. Imitation

MARKETING motor trucks from now on is going to be more and more of a man's job. There is a big and rapidly-expanding market and saturation is so far off that production hereafter will be the only essential factor limiting the number of trucks sold. There is room for all the manufacturers now in the market and for a large number of new ones. But this does not mean that motor truck building is necessarily a sure thing.

It is not sufficient that a manufacturer have ample capital, a good design and facilities to build it well and plentifully. There is danger in too much conventionality. Because one manufacturer has made a tremendous success of a low-priced 1-tonner; because another has been able to sell large numbers of a special type of heavy-duty vehicle; because one more has done wonders with a light delivery vehicle, is no sign that a new manufacturer can step in and duplicate such successes.

Great fortunes are not made by imitation, but by initiation. If the commercial vehicle industry produces a Rockefeller or a Ford it will be because some far-sighted genius has seen, or has blundered upon an article for which the need greatly exceeds the supply.

Deceptive Demands

Too many manufacturers are guided by demand alone. That is not enough. The greatest demand is not always the best market; for if that demand be the best supplied, there competition will be keenest, sales cost will be highest and margin of profit will be narrowest. Demand, furthermore, is not always an indication of a real need. The public often thinks it needs one thing when it really should have something quite different, but which may not be in evidence. Manufacturers who allow themselves to be led, sheeplike, by the greatest crowds, cannot hope, save by superhuman effort or extraordinary good fortune, to rise above the dead level.

Someone produced a ½-tonner at a low figure. Immediately a dozen other makers followed suit. A few of these have made or are making a success of it—the others are wondering why they, too, are not.

Charlie Chaplin is the most successful clown in the world today because he uses his brains as well as his body. Other popular favorites pursued certain methods and had their day. Chaplin would have failed had he followed the same methods. Just being different is not sufficient, though. It was the universal human failing for a certain class of comedy—a failing disclaimed by most people and eschewed by most entertainers because considered in bad taste and unconventional—that he recognized as a need for a different sort of humor.

Charlie's Secret

Chaplin simply supplied a lack. It was not a demand, for the public dislikes to confess a barbaric delight in horseplay. Consequently those who content themselves with catering alone to demand had overlooked it. Chaplin produced a commodity for which there was a latent demand and made it one of the most insistent and paying demands in the world. In so doing he put his own character into the supply to such an extent that it is doubtful if an imitator can ever successfully compete.

It is believed that in the motor truck field such opportunities exist in trucks of low capacity but larger size than ordinary; in trucks of less than 1,000-lb. burden—especially in the very small, simple and low-priced class, of which the English carrier or parcelcar has no prototype in this country; in tractors of light weight and capacity, intended for cheap haulage and elimination of lading delays by trailer interchangeability, rather than for extraordinarily large or heavy freight.

There is need for a very small, low-priced and simple machine to replace the hand cart used by thousands of retail merchants in apartment house districts. A field exists for a special construction of truck and tractor for use in exceptionally rough country and in unusually trying service—with means for securing traction impossible by the conventional and highly-satisfactory means designed for city application.

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To Ship Studebakers on Lake Boats

Two Vessels for Cleveland and Buffalo Shipments

DETROIT, March 7—The Studebaker Corp., of this city, has hired two large lake steamers to ship its passenger cars and motor trucks from Detroit to Cleveland and Buffalo. These vessels will go into service as soon as the ice clears off the lakes and makes navigation possible. This method of shipment has been taken as a precaution to offset the present freight congestion in Detroit and other eastern points and to overcome future difficulties should the freight congestion become more serious than it is at the present time. While many Detroit truck makers have shipped their trucks into the Cleveland and Buffalo territories by boat before, such shipments have generally been carried on the combined freight and passenger steamers running between the three points. It has thus remained for the Studebaker corporation to be the first concern to institute an exclusive freight steamer service for its own product and for those of other concerns should it at any time have unoccupied deck space upon the steamers it has chartered.

SELDENS ON OVERLAND TEST HAULS

ROCHESTER, N. Y., March 9—Beginning on Monday, March 12, the Selden Motor Vehicle Co., of this city, will start two of its new 5-ton models on test runs between Rochester and New York City, a distance of 350 miles. The trucks will leave simultaneously from New York and from Rochester and will run on a time schedule between the two points. Each will carry a capacity load and will stop at the various Selden dealers in the cities along the route.

The purpose of the tests is twofold. It will first enable the Selden engineers to obtain actual operating cost data on the new model and secondly will give the actual overland running times between the extreme points of the long run as well as between any of the intermediate towns and cities. This will prove of great value to the Selden company should it decide to ship trucks into the New York City territory by road to circumvent the present freight car shortage or in case the government should take over the railroads because of a climax in the nation's strained relations with Germany. Besides these two results, the test will also serve to prove to truck purchasers the great possibilities for the overland haulage of goods along the route traversed.

NEW SELDEN 5-TONNER

ROCHESTER, N. Y., March 7—A brand new worm-driven 5-tonner, the largest model ever built by the Selden Motor Vehicle Co., of this city, will be put on the market actively on April 1, 1917. Its price has not yet been decided upon. The big brother of the Selden line, while retaining many of the characteristics of the models previously made, differs in that it incorporates an entirely new method of rear spring suspension designed by Chief Engineer W. T. Norton, Jr., of the Selden company, a four-speed gearset, an especially rugged pressed steel frame, 3 by 9 by ¼ in., and Smith steel wheels as standard equipment. The newcomer differs from previous Selden practice in that it has its gearset mounted amidships instead of in a unit with the motor, this being done for a greater rigidity of the propelling members in that the model will be made in a 153-in. wheelbase for bodies with 12 ft. of loading space and in a 172-in. wheelbase for bodies of 16-ft. clear loading space.

The truck will be made up of standard parts including a Continental motor; Stromberg carbureter; Pierce governor; Eisemann ignition unit with manual control; Brown-Lipe clutch and four-speed selective gearset; Timken front and rear axles; Perfection springs, 3 by 46 in the front and 4 by 52 in the rear and Spicer universal joints. It will be equipped with Firestone tires, 36 by 6 in the front with an option of 40 by 6 duals or 40 by 12 singles in the rear.

This makes the second new model brought out by the Selden company within the past 2 months, the other, a 1-ton internal-gear-driven unit, being fully described and illustrated in the March 1, 1917, issue of THE COMMERCIAL VEHICLE. In that issue the full specifications of the new 1-tonner, selling at $1,385, were compared with those of the 1-ton Selden worm-driven model selling at $1,700.

Motor Truck Club Proves Case

Its Recommendations To Be Adopted in New York License Law

NEW YORK, March 10—Improved regulations for motor vehicle licenses will soon be made effective in New York State as a result of the efforts of the Motor Truck Club of America. Roderick Stephens and Charles G. Bond, respectively president and counsel of the club, went to Albany on March 8 to present their recommendations to the committee on the proposed license bill. These will be incorporated into a new bill together with other clauses discussed at the hearing.

The law distinguishing between the separate license plates bought by manufacturers and dealers is unsatisfactory In the first place there is no specific identification on the license plate to indicate the individual vehicle of a group run by any manufacturer or dealer. Further, the State authorities have lost revenue through the present clause which enables a purchaser to use the dealer's license plate 10 days after he has bought the vehicle in order that he may have time to get his license from the Secretary of State's office. Many owners, however, have never taken out individual licenses, but have continued to use the dealer's plate, thus effecting a small saving.

To curb this illegal practice the 10-day clause will be abrogated in the new bill, and the owner will have to purchase his individual license before using the vehicle. In order that the buyer may have immediate use of his vehicle licenses will be issued from the county clerk's office, thus avoiding the present delay involved in communicating with the Secretary of State.

Senator Hewitt was absent from the hearing and his place as chairman was taken by Douglas Robinson. Assemblyman Wells and Secretary of State Hugo were present.

Special license plates will be required for manufacturers and dealers, and the use of these licenses will be strictly limited to commercial purposes.

The text of the Motor Truck Club's recommendations is as follows:

First—We suggest in order to make more complete the identification of motor vehicles operated under a manufacturers and dealers number, that each set of plates issued to the manufacturer or dealer shall have in front of the letter M. a serial number in accordance with the number of plates issued to such manufacturer or dealer, so that if a dealer secures fifty sets of plates the serial number in front of the letter M shall begin at 1 and run to 50, and the number will read "25 M 335 N. Y."

The length of this number may be objected to, but as regards this, it may be borne in mind that the number of dealers to whom licenses would be issued would not exceed 1,000, so that his number would probably never contain more than three figures.

Second—We suggest the addition to subdivision 1 of Section 284, of the following:

"No manufacturer or dealer shall use any motor vehicle registered under the provisions of this section on the highways of this State for any other purpose than the trial, test or adjustment of such motor vehicle, or in connection with its demonstration to a prospective buyer, or in connection with the sale of such vehicle or similar vehicles by such manufacturer or dealer, and when so used such motor vehicle shall be operated at all times by such manufacturer or dealer, its officer or employee."

Third—We suggest that the dealer be required to notify the Secretary of State of the sale of any vehicle and the number on the plates under which said vehicle is being temporarily operated.

Motors to Save Circus $1200 Monthly

Truck Transportation to Give Better Service Cheaper

NEW YORK CITY, March 12—Twelve hundred dollars is the amount of money the new motorized circus expects to save every day in railroad transportation charges. This estimate is based upon the daily average cost of hauling to all big circuses minus the estimated motor up-keep for the new enterprise.

As a result of this statement, issued at the headquarters of the United States Circus Corp., 140 West Forty-second street, New York, motor truck manufacturers are watching the project with a great deal of interest.

"The success of this enterprise means that the motor truck has become a real competitor of the railroads and electric lines on short hauls," said one manufacturer in discussing the motorized circus. "When it can be proven that 100 motor trucks with 100 trailers can save $1,200 each day in overland hauls of from 30 to 50 miles as this circus claims it will, then a new field has opened for the motor truck."

The up-keep cost of the caravan is expected to be kept at a minimum. Only skilled mechanicians will be employed as drivers. The tire equipment consists of Firestone Giants throughout, while the Kelly-Springfield Motor Truck Co. supplies the trucks and the Troy Wagon Works the trailers.

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Californians to Fight Truck Bill

Claim Act Discriminates Against Commercial Vehicles

LOS ANGELES, March 8—The commercial vehicle interests of this State are planning to put up a fight at the current session of the State legislature, which they declare is for their very existence. The Motor Truck Club of this city is one of the most active agencies in the effort to see that truck owners and dealers receive some consideration at the hands of the law makers. The claim is made that the railroads and other interests are behind the movement to restrict the use of commercial vehicles so rigidly that the development of their use will be curtailed and an actual loss to the people of the State be brought about.

The head of the transportation department of a large grocery firm here which operates a fleet of twenty trucks says that if the proposed law is enacted, it will become a menace to its delivery department. Department stores and other large truck users say the effect will be the same with them. This is because it is proposed to limit the speed of trucks to 15 miles an hour.

The use of more than one trailer is to be prohibited. In bringing supplies from Los Angeles Harbor to the city, it is now the custom to use as many as half a dozen trailers. By this method some real competition has been afforded the railroads. Wholesalers have been buying trucks and trailers for this purpose and can operate them cheaper than it costs for railroad freight. Trucking companies have been organized that have built up a paying business. At a time when the high cost of living has become serious, any increase in transportation charges will have to be borne by the ultimate consumer and the public favors the cheapest way.

It is proposed to limit the weight of the load to be borne on a truck. There is a division of sentiment among owners and operators on this clause. The contractor who figures on piling on everything possible without consideration for the truck, tires or road is against this. He usually figures by the job and then employs as few trucks as possible to get by requiring the operators to haul excessive overloads. But the owners who figure by the ton-mile system and make it a practice to refrain from overload have no opposition.

The chief cause of complaint against trucks is that they damage the roads. The truck people answer by saying that trucks are a recognized utility and California should be far-seeing enough to build roads that will withstand their use. It is pointed out that concrete roads over which heavy hauling is forbidden, such as the famous Wilshire Boulevard and Sherman Way, deteriorate under pneumatic tires on rapidly moving pleasure vehicles as fast as does the road to the harbor. The claim is made the highways are arteries of commerce and not means to pleasure and sight-seeing exclusively. It is also brought out that properly tired trucks are not a detriment to the road.

In southern California fully 50 per cent of the intercity transportation is by motor truck.

SMALL TOWNS CANNOT TAX THROUGH TRAFFIC

LOS ANGELES, CAL., March 6—Another petty obstacle to motor truck transportation has been knocked out in California. The alertness of railway men in pointing out motor traffic as a field for exploitation to the license-money-hungry small municipalities has resulted in passage of objectionable ordinances in a considerable number of California municipalities. A decision was handed down the first week in March by the district court of appeals holding invalid an ordinance passed by Tropico, a city of the sixth class, requiring anyone operating a motor vehicle carrying passengers for hire within the city to secure a license, the decision declaring it was not applicable to through traffic.

The court discharged F. L. Smith, against whom action was brought by the city to compel him to pay the license fee. Smith operates a bus service between Los Angeles and Bakersfield, passing through Tropico on a main thoroughfare, but without stopping in that city to take on or discharge passengers. The court ruled that a city of the sixth class is not vested with authority to enact an ordinance imposing a tax by license upon vehicles conducting the business of transporting passengers over public highways a small part of which extends through such cities. Also that the power of city is limited to impose a license upon a business transacted and carried on in such city.

Coming Commercial Vehicle Events

March 20.....	Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.
March 20.....	Philadelphia, Pa., Monthly Meeting, Pennsylvania Section, S. A. E.
March 21.....	New York City, Annual Beefsteak Dinner of the Motor Truck Club of America, Churchill's, Broadway at Fiftieth Street.
March 21.....	Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.
April 3-10.....	San Francisco, Cal., Motor Truck Show, Home Industry League and Motor Truck Dealers' Assn. Civic Auditorium.

Gary Truck To Build New Factory

Plant Will Have Capacity of 500 Motor Trucks Yearly

GARY, IND., March 7—Orders have been given by the Gary Motor Truck Co. for the construction of a factory building to be ready for occupancy in 60 days. The building will be constructed of steel, brick and glass, and will cover a space of 132 by 100 ft. The plant will have facilities for turning out 500 trucks a year.

GUARANTY SECURITIES ELECTS OFFICERS

NEW YORK CITY, March 2—At the annual meeting of the Guaranty Securities Corp. the following were elected as officers and directors for the coming year: George C. Van Tuyl, Jr., president; E. S. Maddock, second vice-president and treasurer; J. Alexander, secretary; F. A. Franklin, assistant secretary; W. J. Bold, assistant treasurer; directors, J. D. Dort, Paul Fitzpatrick, Robert Gray, C. P. Howland, D. R. McLennan, E. S. Maddock, T. G. Meachem, Stanley Roberts, E. F. Rorebeck, Alfred P. Sloan, Jr., Geo. C. Van Tuyl, Jr., John N. Willys, J. Alexander.

CHARGE PENNSY MOTORS MISMANAGED

PITTSBURGH, PA., March 8—Allegations that the Pennsy Motors Co. has been mismanaged by its officers and a petition for a temporary receivership are contained in a bill of equity filed in the United States district court recently. The bill was filed by G. W. Berger, Henry C. Wasmuth, John P. Rupp, L. H. McCracken and the Pennsy Motors Stockholders' Assn.

TRUCK SHOW FOR FRISCO

SAN FRANCISCO, CAL., March 6—Barred from the passenger car show recently held in this city on account of lack of display space local dealers and truck manufacturers are enthusiastically co-operating to make the first commercial vehicle show ever held in the Civic Auditorium a representative exposition of the merits of eastern and locally-manufactured commercial vehicles. The California product will be shown side by side with the truck of Eastern manufacturers and the Home Industry League will be represented by elaborate displays from the Moreland, Doane, Kleiber and Hewitt-Ludlow factories. Among the Eastern factories which have reserved space are the Wichita, Sterling, Smith Form-A-Truck, Republic, Indiana, Autocar, Mack, Saurer and Denby. The exhibit is under the management of Ivan R. Gates.

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General Motors Yields 12 Per Cent

Company Has Sold 95,533 Cars and Trucks in 7 Months

NEW YORK CITY, March 10—The General Motors Corp. of Delaware yesterday declared a quarterly dividend of 3 per cent on its common stock. The last dividend on the common stock, declared 3 months ago, was 1 per cent, or at the annual rate of 4 per cent. The dividend just declared is at the annual rate of 12 per cent. The board of directors of the General Motors Co. of New Jersey has declared a regular quarterly dividend of $15 a share on its common stock, establishing an annual dividend rate of $60 a share on its common stock. The dividends of both companies are payable May 1 to stock of record April 12.

The General Motors Co. of New Jersey has sold during the 7 months ended Feb. 28, 1917, 95,533 cars and trucks, as compared with 73,057 cars and trucks for the same period a year ago.

The gross sales for these two periods are respectively $102,930,670, as against $86,675,713, and undivided profits for common stock are respectively $16,000,984 for the last 7 months, as compared with $14,991,979 for the 7 months ended Feb. 29, 1916.

A quarterly dividend of 1½ per cent on the preferred stock has also been declared by the General Motors Corp. of Delaware. The dividend is payable May 1 to stock of record April 12. The preferred dividend of the New Jersey company is 3½ per cent, payable May 1 to stock of record April 12.

RECORD PACKARD TRUCK BUSINESS

DETROIT, March 13—More than $4,000,000 worth of Packard motor trucks were sold to business men of the United States and Canada in January and February, according to a report by the manufacturer.

Nearly all these trucks were sold into the domestic industries of peace. A very few orders from the United States army are included in the total, but none from foreign military establishments.

"The prosperous condition of the nation's business probably cannot be indicated more effectively than by this record sale of motor trucks," said R. E. Chamberlain, manager of the truck sales department of the Packard Company. "I think the volume of truck sales is almost as faithful a barometer of general business as is the price of steel. For trucks are used to transport goods, and when more trucks are bought, it means more goods are moving.

"Reports of our field representatives, and my own observations in recent trips extending as far west as Kansas City, lead us to believe that we can sell $3,000,000 worth of trucks in March alone."

Cleveland is the Packard dealership which sold the most trucks in January, and the Detroit retail sales branch took first place in February.

Fleets of as many as twenty-five trucks on one order were sold to big buyers. Among the nationally-known names listed among Packard buyers in January and February are the Standard Oil Co., Shell Oil Co., Pierce Oil Corp., Swift & Co., Armour & Co., Nelson Morris & Co., American Express Co., Endicott, Johnson & Co., Bethlehem Steel Co., Philadelphia & Reading Coal & Iron Co., American Can Co., Libby, McNeil & Libby Co., Crane & Co., Schlitz Brewing Co., the National Tube Co. and Arbuckle Bros.

COMMERCE PLANS ADDITION

DETROIT, March 8—The Commerce Motor Car Co. will erect a new building four stories high, 100 by 300 ft., to adjoin its present factory buildings.

NEW FACTORY FOR MORELAND

LOS ANGELES, CAL., March 9—The Moreland Motor Truck Co., truck manufacturer, is planning the erection of a new plant at Alhambra, to cost about $200,000.

KOSHOLLEK TO BUILD FACTORY

STEVENS POINT, WIS., March 3—Paul F. Koshollek, Stevens Point, Wis., inventor of a new type of combined four-wheel drive and steering device for motor vehicles, upon which he has just been granted letters patent, will establish a small factory at once, principally for the production of working models. Mr. Koshollek will try to enlist capital to organize a manufacturing company, and probably will also sell the rights to the use of the device upon a royalty basis.

STEGEMAN TRUCK PLANT ALMOST READY

MILWAUKEE, WIS., March 10—The Stegeman Motor Truck Co. is rushing work to completion on additions which will afford 50,000 sq. ft. of floor space. After April 1 or May 1 the output of Stegeman trucks will be about doubled. The manufacture of the complete axles used in the trucks will be undertaken at once, and numerous other parts, until now purchased, will be made in the enlarged shops.

BROWN CARRIAGE TO BUILD

CLEVELAND, March 9—The Brown Auto Carriage Co., one of the largest motor vehicle body concerns here, is to increase its capital stock to $750,000. It is the intention of the company to build a new plant.

ONEIDA SECURES PLANT

GREEN BAY, WIS., March 10—The Oneida Motor Truck Co., Green Bay, Wis., organized with $300,000 capital to build the Oneida motor truck, expects to start manufacturing operations by April 1. The company has taken a lease on the large factory building at Webster Avenue and Willow Street, Green Bay, where space 140 by 50 and 100 by 60 ft. is available.

REO GETS GIER STEEL PLANT

LANSING, MICH., March 8—The Reo Motor Car Co. has purchased the old steel plant belonging to the Gier Pressed Steel Co. and will use it temporarily for storage purposes. The plant has 44,000 sq. ft. or floor space.

Studebaker Profits $8,611,245.08

Gain of 51.39 Per Cent in 1916 Over Previous Year

SOUTH BEND, IND., March 7—Studebaker profits for 1916 amounted to $8,611,245.08, 51.39 per cent more than the year previous, according to the annual report of the corporation recently issued. The net sales totaled $61,988,594.09. The profits provided for a 7 per cent dividend on the preferred stock, 10 per cent on common stock, leaving $4,843,695.08 to be added to the surplus account, which is now equal to 57.40 per cent of the outstanding common stock. The book value of the common stock Dec. 31, excluding good will, was $91.38 per share.

The net profits decreased somewhat towards the close of the year due to the inability to fill dealers' contracts because of the freight car shortage. There has been a steady increase in sales, however, in recent months. No war orders have been sought or obtained by the company.

WAUSAU GETS LAMSON TRUCK

WAUSAU, WIS., March 3—Citizens of Wausau, Wis., have subscribed for $50,000 worth of capital stock in the Lamson Truck & Tractor Co., Chicago, to insure the removal of the industry to the Wisconsin city. Arrangements also have been completed for the purchase of a site and the erection of suitable buildings for the occupancy of the Chicago concern.

MENOMINEE PRICES CHANGED

MENOMINEE, MICH., March 13—Changes in the prices of the five models of Menominee trucks have been announced by the Menominee Motor Truck Co. The changes are as follows: The ¾-tonner, formerly $1,295, now $1,245; 1-tonner, formerly $1,575, now $1,790; 1½-tonner, formerly $1,775, now $2,050; 2-tonner, formerly $2,250, now $2,475; 3½-tonner, formerly $2,775, now $3,275.

RANIER DELIVERING FIVE VEHICLES DAILY

NEW YORK CITY, March 12—The Ranier Motor Corp., Flushing, N. Y., is now making deliveries of its commercial vehicles. The factory was started less than 6 months ago. Deliveries are now averaging five machines daily.

COMMERCE PRICES RAISED $100

DETROIT, March 14—Special to THE COMMERCIAL VEHICLE—On account of the continued high prices of materials it has been necessary for the Commerce Motor Car Co. to raise the prices of its ¾- and 1-ton trucks $100 on each model. The change goes into effect immediately, all orders received after to-day falling under the new list. The 1-ton model, formerly selling at $1,140, now lists at $1,240 and the ¾-tonner, formerly at $875, is now priced at $975. Another ¾-ton model, formerly selling for the latter figure is now listed at $1,075.

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Goodyear Plans Big Stock Sale

Measure Taken to Meet Current Expenses of Increased Production

AKRON, OHIO, March 3—In order to meet the increasing expenditures of its large scale production the Goodyear Tire & Rubber Co. is arranging to obtain close to $10,000,000 through sale of stock. Of this amount $6,000,000 preferred has been sold to bankers, and the common will be offered first to the present stockholders on the basis of a chance to buy an amount equal to 20 per cent of their present holdings at par. The price of the new preferred is not announced. The company reports that business is now running 70 per cent ahead of that done a year ago, and estimates $100,000,000 gross business for the year. The company's capitalization is $50,000,000, $25,000,000 preferred and $25,000,000 common. About $17,000,000 of each has been issued.

WILSON BODY GETS FACTORY

DETROIT, March 6—The C. R. Wilson Body Co. has secured the plant of the Hargreaves Mfg. Co. and will use the 80,000 sq. ft. of floor space it contains for making closed bodies of every type.

STEEL PRODUCTS DIVIDEND 10 PER CENT

DETROIT, March 8—At the annual meeting of the Board of Directors of the Detroit Steel Products Co., held recently, a cash dividend of 10 per cent was declared on the common stock, besides the regular annual dividend of 7 per cent. The following officers and directors have been elected for the ensuing year: President, J. G. Rumney; vice-president, R. S. Drummond; secretary, H. F. Wardwell; treasurer, E. R. Ailes; board of directors, J. G. Rumney, R. S. Drummond, Walter S. Russel, Henry Russel, Leo M. Butzel, Mason P. Rumney and H. Otto Meyer. The company makes Detroit self lubricating springs for motor trucks.

WARNER BUYS MENHALL INTERESTS

BELOIT, WIS., March 3—James Menhall, vice-president of the Warner Mfg. Co., has sold his complete holdings to A. P. Warner, who thereby becomes sole owner. The company makes the Warner auto trailer.

STANDARD PARTS OPENS DETROIT BRANCH

DETROIT, March 8—The Standard Parts Co., the consolidation of the Perfection Spring Co. and the Standard Welding Co., both of Cleveland, has opened a Detroit office. Voss and Palmer, of the rim and tube division, and W. P. Culver, of the spring division, are in charge.

STANDARD ROLLER AND ROCKWELL-DRAKE SOLD

NEW YORK, March 3—The Standard Roller Bearing Co. plant in Philadelphia and the Rockwell-Drake plant in Plainfield, Conn.. have been sold to the Marlin Arms Corp. Both these companies made ball-bearings, the Philadelphia concern also making roller bearings. Two days ago the sale of the Standard Roller Bearing Co. assets to Frank Smith, representing a syndicate of bankers, was confirmed by Judge Thompson in the United States District Court, Philadelphia. The Standard Roller Bearing Co. went into the receiver's hands in October, 1913. The company was organized in 1901 and employed about 1000 men.

COVERT PLANT STILL AT LOCKPORT

DETROIT, March 10—Through a misunderstanding it was stated in the March 1 issue of THE COMMERCIAL VEHICLE that the entire Covert business had been moved to Detroit from its former location at Lockport, N. Y. This is not true, since only the sales, engineering and service departments have been moved here. The plant itself remains at Lockport.

N. A. C. C. PLEDGES DEFENSE AID

NEW YORK CITY, March 9—At a meeting with a record attendance of the motor vehicle manufacturers of the country associated in the National Automobile Chamber of Commerce, yesterday, the fullest co-operation was offered to President Wilson and the other officials at Washington in connection with the present international crisis. The makers pledged themselves subject to the call of the authorities at Washington for any emergency, offering their factories, their equipment and their resources generally for the purpose.

The telegram which was sent to President Wilson with duplicates to Secretary Daniels of the Navy and Secretary Baker of the War Department is as follows:

"The members of the National Automobile Chamber of Commerce assembled here to-day offer and pledge you our fullest co-operation in the present crisis. The automobile industry, which is the third largest in the United States, is ready to serve its country with all its resources of trained mechanics, machine tool equipment and modern factories. We know our industry can be of immediate help in preparing our country for any emergency and desire you to feel our membership of 101 manufacturers is ready and available subject to your call."

Feeling that the best interests of the industry do not warrant an extension of the national shows beyond those of New York and Chicago the directors were unable to accept the cordial invitation of San Francisco to hold a national exhibition in that city. Thanks were extended to the people of San Francisco for their invitation and the hope expressed that the recent show so ably conducted there by the local representatives of the manufacturers may be continued on the same creditable plane.

It was reported that transportation conditions during the past few months have been the worst ever known, with the railroad congestion centered largely in the Middle West, where most of the cars are made, and where the low temperature added to the difficulties of operation.

Lee Rubber Sales Total $3,346,761

Income for 1916 Amounted to $251,063; Dividends $225,000

NEW YORK CITY, March 8—Net sales of $3,346,761 are reported by the Lee Rubber & Tire Corp. in its annual statement covering the period ended Dec. 31 last. The cost of goods and all expenses were $3,340,860, leaving an operating profit of $246,901. The income from rentals, etc., totaled $4,162, making the total income $251,063. Out of this amount $13,726 was paid out for interest, discounts, etc., leaving $237,337 for dividends. The stockholders received $225,000, leaving a surplus of $12,337.

The earnings for the first half of the year were satisfactory, but labor troubles, together with the great increase in the cost of crude rubber and fabric, caused a falling off in profits during the last 6 months.

The company has made some changes in the process of its manufacturing and is now producing not only the wrapped tread type of tire but molded tires.

S. A. E. STUDYING TRACTOR DEVELOPMENT

NEW YORK CITY, March 2—Special attention to the development of the tractor is being given by the Society of Automotive Engineers. The committee in charge of this department of the society's activities consists of H. L. Horning, Fred Glover, C. M. Eason, E. R. Greer, George T. Strite.

ALL REPUBLIC PRICES INCREASED

NEW YORK CITY, March 14—The prices of all Republic models, made by the Republic Motor Truck Co., Alma, Mich., have been increased from $45 to $125, as follows: The ¾-tonner $45, from $725 to $770 in the chassis; the 1-tonner $100, from $1,095 with standard stake or express body to $1,195; the 1½-ton model $100, from $1,275 to $1,375 in the chassis; the 2-tonner $110, from $1,675 to $1,785 in the chassis and the 3½-ton truck $125, from $2,550 in the chassis to $2,675.

The ¾-tonner, known as the Dispatch model, is also offered with two types of standard bodies, the new price with either type being $45 in advance of the old. With an express body the new price is $795 and with a panel type, $820.

PRIDE PREDICTS TRUCKING RATE RISE

NEW YORK, March 8—Trucking rates will be increased before the end of the year, according to G. H. Pride, vice-president of the Motor Truck Club of America. This, he contends, is an inevitable adjustment resulting from the special taxes placed on motor trucks by the Hewitt-Wells bill. The trucking business was previously adjusted to the taxes prevailing before the new taxes, and was charging its rates to get a fair profit accordingly. The new taxes have reduced the margin of profit, and as all trucks suffer in this way, it is likely that at least part of the burden will be shifted to the consumer.

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Better Methods of Truck Merchandising Bring Results at Boston Show

Two Novel Exhibits Enabled Prospective Buyers to View Trucks from New Angle—One Showed Method of Operation

BOSTON, Mass., March 10—Two methods of better motor truck merchandising were in evidence at the Boston show which closed here tonight. Both of these new methods were based upon the fact that purchasers of motor trucks buy such vehicles upon what they are made of rather than how they look.

Passenger cars are to-day most generally bought on appearances. The average American passenger car owner buys his car on how it looks. It must have style. He relies upon the generally recognized ability of all manufacturers to make their cars run. Of course, with the rising cost of fuel, owners are paying more and more attention to the cost of operation. They want cars economical of fuel, tires and maintenance, but—they must be good looking. To prove this contention, evidence the action of the largest manufacturer of motor cars in the world who only last year departed from his previously strictly-adhered-to policy by bringing out a new model with a more pleasing hood over the motor and a more graceful body considered more or less of the streamline type. He saw the trend and prepared to meet it.

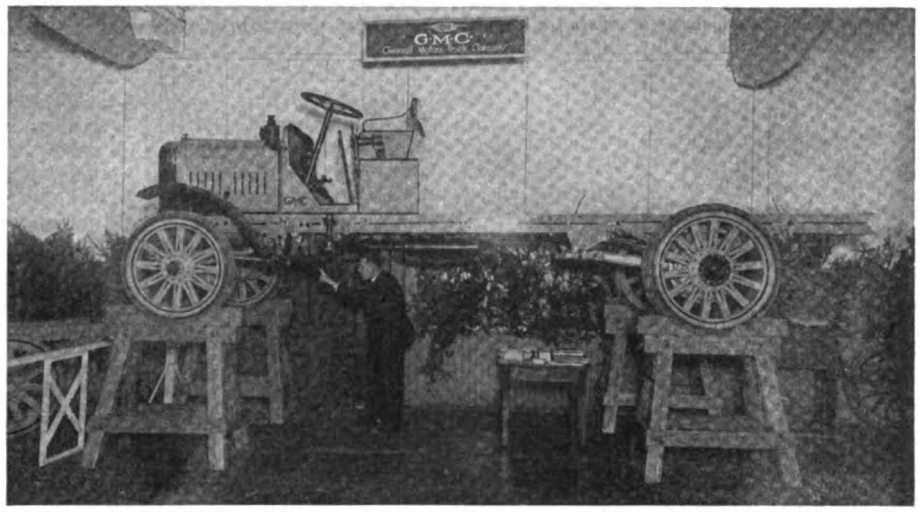
There is a trend toward the better merchandising of motor trucks. It is not toward appearance. Motor trucks cannot be sold by placing them on velvet carpets laid on raised platforms and illuminating them by banks of lights concealed by imitation foliage festooned from the beams and girders of the exhibition hall. It is all different with trucks.

People who buy trucks expect to make money by using them in preference to horse vehicles. They are a strictly business proposition. Prospective purchasers care little for appearance provided the truck will run and keep running with but little maintenance cost. If they happen to be considered good looking, that is but an added advantage. First of all they must deliver the goods. Everything else is secondary.

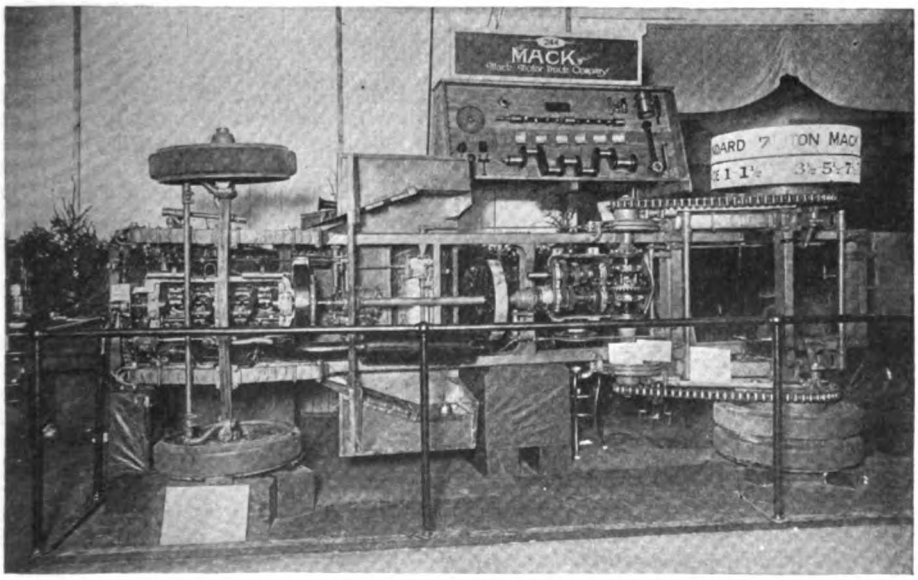
But how is the dealer of passenger cars and trucks going to depart from his inbred habit of selling cars by appearances and sell trucks by proving to his prospects that they have the goods which will enable them to deliver? This seems difficult but it is not.

Why not show them the goods?

That is the simple answer. It is exactly what two enterprising manufacturers did at the Boston show. They showed their prospective customers the goods of their trucks which will enable them to deliver.



The 3½-ton G. M. C. chassis mounted on stilts under each wheel so that the prospective buyer might walk directly under it and view the under portion of the truck without hindrance



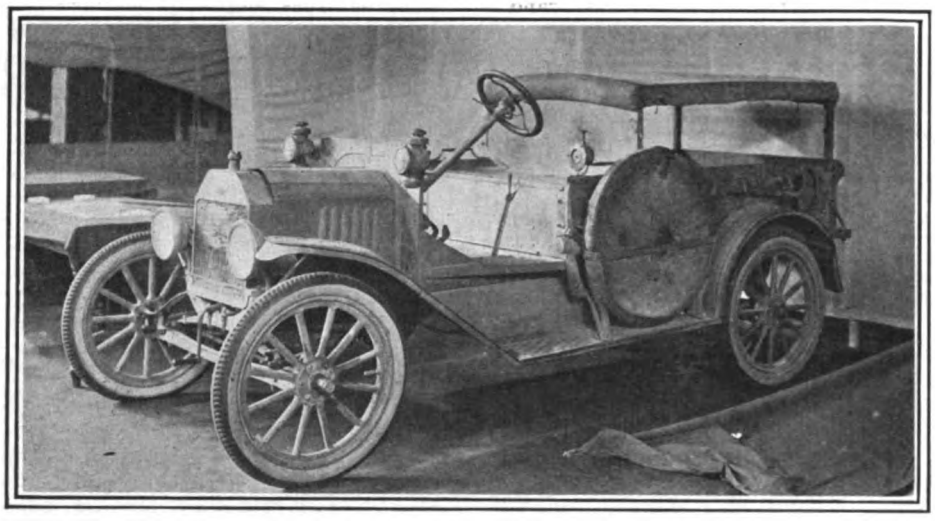
The 7½-ton Mack laid on its side, which attracted such a great deal of attention at the Boston show. The motor and the remainder of the driving mechanism was kept continually in motion by an electric motor driving a pulley on the propeller shaft. The accessibility of the motor, gearset and jackshaft was brought out by removing the bottom cover plates of those three units

But how? Not by so many disconnected parts, a crankshaft all by itself, a worm gear or a link of chain. These have little meaning to the average truck buyer. They must be put together. They must be associated with the remaining elementary parts of the truck. This is analogous to one of the three great principles of the human mind, association, the other two being repetition and memory. They associated every working part with every other and in a manner in which the average truck owner seldom has the opportunity of seeing.

One turned a complete chassis over on its side, removed the lower half of the crankcase, the clutch housing and the gearset and then set all of these parts in operation by driving them off a pulley on the propeller shaft by means of an electric motor.

The other set his truck up on 5-ft.

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The little Ford that "rambled right along" with the Twenty-third on the Mexican border

horses under each wheel so that the prospective buyer might walk directly under the chassis and see it from a different angle than ever before. Both of these ideas are shown in the accompanying illustrations.

All Parts Associated

In the first case, perhaps better than the second, the dealer showed every moving part correctly associated with every other, their sizes and how they worked. Not to be misled by mere size rather than strength, the wise dealer must point out what material each part is made of, so that smaller parts of greater strength will not be at a disadvantage in comparison with more bulky units of lesser capacity.

While it must be admitted that the mere size of parts, the material of which they are made or even the manner in which they are put together for operation, is not always a true criterion of long and faithful service, the wise dealer will remember that most trucks are sold first and tested out second. So long as we have no-action shows where trucks do not actually cover ground on their own wheels, under their capacity loads, let us present the various parts in their proper association and in the most vivid and realistic manner.

Selling on Mind Psychology

Let us work on the principle of the mind. Let us associate every part of the truck with the others. Let us do this in as striking a manner as possible. Then let us proceed to the second great principle of the human mind and repeat this association until it is infallibly impressed on the memory of the would-be buyer. Reaching that third and last principle of the mind, future sales of the truck will make themselves, provided it has the goods by which it can deliver.

Of these two exhibits, that of the truck laid on its side, a 7½-ton Mack AC model, drew the greatest attention because of its novelty and the fact that the moving parts attracted the eye of passersby who might not otherwise have stopped. The exhibit was really of considerable educational value, for besides pointing out the accessibility feature of the truck comprised by the bottom instead of top covers on the gearset and jackshaft, it also showed many exactly how the power is transferred from the engine to the rear wheels to make the vehicle run.

While many of those who stopped before the railing by which the exhibit was inclosed were merely sightseers who wandered down into the basement after looking over the various passenger car offerings, the exhibitor obtained almost double the number of prospects that he did last year in the identical booth with vehicles conventionally placed on all four wheels.

One of the men who stood before the exhibit and watched the revolution of the engine crankshaft, the clutch, change-speed gears, jackshaft and finally the top driving chain and wheel, was heard to remark that he never knew there were so many parts required to propel a motor truck along the street. To him, trucks had seemed to simply glide along the thoroughfares without any apparent exertion and the revelation of the many parts which were responsible for their motion was an education in itself—the first principle of the mind—the association of every part with every other.

Good Results Obtained

The results obtained from the exhibit at the Boston show and similarly at the Chicago branch of the truck maker, the International Motor Co., New York City, were considered so good that it intends to work out the second principle of the mind, repetition, by setting up similar permanent exhibitions in the financial districts of New York City and Philadelphia, Pa., where men who have the final say in the purchase of trucks will have a good opportunity of studying just how a modern motor truck operates.

The idea of the exhibition of the truck on stilts was not carried out as thoroughly as it might have been because of chairs placed on the floor between the horses and directly beneath the chassis. The tired salesmen sometimes occupied these, and although the chairs were moved when a prospect was shown the under portion of the chassis, better results might have been obtained had the space under the chassis been free at all times. Under such conditions and with a free access to the truck for all showgoers, it is probable that many of them would have walked directly under it and stopped to inquire the wherefore of this and that part with a resultant larger number of future sales prospects.

Boston's Largest Truck Show Proves Greatest Success

(*Continued from page* 7)

The complete offering included trucks of the following makes:

Atlas	Krebs
Atterbury	Mack
Autocar	Mackbilt
Bethlehem	Maxfer
Brockway	Menominee
Commerce	Metz
Cunningham	Netco
Denby	Overland
Duplex	Packard
Federal	Pierce-Arrow
F. W. D.	Reo
G. M. C.	Riker
Gramm-Bernstein	Rush
G. V. Mercedes	Selden
G. V. Electric	Signal
Hurlburt	Stewart
I. H. C.	Studebaker
Indiana	Transport Tractor
Jeffery	Stegeman
Kelly-Springfield	Vim
	White

Of those listed all were shown in the Mechanics' building basement except the Commerce, Mackbilt, Maxfer and Metz. The Commerce had an exhibition of its own in the lobby of the Copley Square Hotel and the Maxfer was shown in its own salesrooms across the street from the Mechanics' building. The Mackbilt was exhibited in Horticultural Hall, the only truck in the building with the exception of displays of Ford adapters made by the Smith Form-A-Truck Co., and the Redden Truck Co. The Metz delivery model was shown upstairs in Mechanics' building. It formed a part of the Metz passenger car display, which was shown in a room set off from the rest of the floor and known as Metz Hall.

While all the tickets sold had stubs entitling the holder to enter Horticultural Hall, the attendance at the latter building was far less than that at the main building. For this reason those exhibitors who had to take space in the detached structure were somewhat dissatisfied, especially as there were one or two exhibits, for instance of Cape Cod dories, which had no rightful place in a motor vehicle show. If the space given over to the boat exhibit in the basement had been reserved for trucks it is probable that the Mackbilt and the Redden Ford adapters could have been shown

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in the basement of the main building in their rightful locations.

Novel Advertising Body on White

Of the truck exhibits, the Autocar and the White companies had the largest displays, each concern showing eleven vehicles, not counting the fire apparatus shown by the White company. No changes had been incorporated in either of those makes, so that all of the vehicles were shown with various types of bodies with the exception of one Autocar chassis. Similarly, all of the trucks of both makes shown were sold before they entered the show, some of them being in service for several years.

The Autocar and White exhibits were almost evenly matched as to versatility except that one of the White displays was a 1½-tonner mounting a brand new type of glass sided body through which are shown a series of illuminated advertising signs. These signs are painted in transparent colors on specially prepared curtains which are automatically moved from one side of the body to the other by means of an electric motor and suitable stop mechanism interconnected with switches controlling the turning out of the illuminating lights when the curtains are in motion and turning them on when they are automatically stopped temporarily. These curtains were put into operation at the show by means of current secured from the lighting circuit. In actual operation on the streets, the current for revolving and illuminating the curtains will be secured from a storage battery and generator set driven off the truck engine as outlined in the March 1, 1917, issue of THE COMMERCIAL VEHICLE.

Mack Exhibit Attracts Crowds

The Mack and the G. M. C. exhibits attracted a great deal of attention because of the manner in which they were arranged. As treated of more fully on pages 17 and 18 of this issue, the principal feature of the Mack display was one of the giant 7½-tonners turned over on its side. The lower portions of the engine crankcase, gearset and jackshaft housings were removed to show the accessibility of all of these parts from the bottom instead of from the top as is the usual practice.

The entire driving mechanism was

(*Continued on page* 39)

Complete List of Exhibits and Exhibitors at the Brooklyn Show

Roster of Vehicles in Revived Truck Exhibition

Make	Exhibitor—Address	Capacity In Tons	Body Type
Armleder	Broadway Motor Truck Co. New York	2	Chassis
		3½	Chassis
		3½	Steel dump
Autocar	Kohn Delivery Contg. Co., New York	1½	Screen
Collier	Broadway Motor Truck Co., New York	1½	Chassis
		¾	Express
D-E	Colonial Motor Tk. Sales Co., Bkln.	¾	Panels
		1	Chassis
Dodge Bros.	Bishop, McCormick & Bishop, Brooklyn	½	Panel
		½	Covered express
		½	Cutaway chassis
		½	Panel
Federal	Morton W. Smith, Inc., New York	1½	Army
		2	Chassis
		3½	Slat, farm
Fulton	Lawrence Motor Sales Corp., New York	1	Chassis
Garford	Garford Motor Truck Co., New York	2	Chassis
G. A. Schacht	G. A. Schacht Motor Truck Co., New York	2	Chassis
		3	Chassis
G. M. C.	General Motors Truck Co., New York	¾	Panel
		2	Van
		3½	Rack
		5	Steel dump
Gramm-Bers'n	R. E. Taylor Corp., New York	2	Chassis
		3½	Chassis
		5	Chassis
		6	Wood dump
		6	Wood dump
Hall	H. A. Edwards Sales & S. Co., Brooklyn	3½	Furniture, open
Hurlburt	Hurlburt Motor Truck Co., New York	1½	Chassis
		3½	Chassis
		7	Chassis
Inter-State	Garland Automobile Co., Brooklyn	½	Panel
Kisselkar	Crown Motors Corp., N. Y.	2	Chassis
Larrabee	Larabee-Deyo M. T. Agency, New York	2½	Chassis
Maccar	Pitts Motor Car R. & S. Corp., Brooklyn	2½	Van
		3½	Chassis
		5½	Chassis
Mack	International Motor Co., New York	2	Rack
		3½	Chassis
		5½	Steel dump
Maxfer	Nickerson & Schroeder, Inc., Brooklyn	1	Chassis
Modern	H. A. Edwards Sales & S. Co., Brooklyn	1½	Glass
Overland	Willys-Overland, Inc., Bklyn	2/5	Panel
		3/5	Chassis
		3/5	Express
		3/5	Panel
Packard	Packard Motor Car Co. of New York	1½	Chassis
		1½	Cutaway chassis
		5	Wood dump
		6	Chassis
Pierce-Arrow	Harrolds Motor Car Co., New York	2	Chassis
		2	Van
		5	Chassis
		5	Chassis
		5	Steel dump
Rainier	Rainier Motor Corp., Flushing, L. I.	½	Chassis
		½	Express
		½	Panel
Reo	Reo M. C. Co. of N. Y., Bklyn	¾	Chassis
		¾	Express
		¾	Hearse
		2	Chassis
Republic	Republic Motor Sales Co., New York	¾	Panel
		1	Chassis
		1	Panel
		1	Piano box, w. top
		1½	Screen
		2	Chassis
Riker	Locomobile Co., Bridgeport, Conn.	4	Steel dump
		4	Chassis
Rush	Nickerson & Schroeder, Brooklyn	½	Chassis
		½	Panel
Selden	Manhattan Motors Corp., New York	1	Chassis
		3½	Steel dump
Service	Service Motor Truck Co., New York	2	Chassis
		3½	Chassis
Signal	Curth Auto Sales Co., Bklyn.	2	Van
		3½	Chassis
		5	Steel dump
Sterling	Sterling Motor Truck Co., New York	2½	Stake
		5	Chassis
		7½	Wood dump
Stewart	Lincoln Motor Co., N. Y.	¾	Chassis
		¾	Panel
		1	Chassis
Studebaker	Studebaker Corp., Brooklyn.	1½	Chassis
		½	Panel
		½	Station wagon
		1	Chassis
		1	Express
		1	Panel
Sullivan	Broadway Motor Truck Co., New York	1½	Express
		2	Stake
United	United Line Service Corp., New York	2	Chassis
		5	Steel dump
U. S.	Economy Motor Truck Co., New York	2½	Chassis
		3½	Chassis
Velie	Garland Automobile Co., Brooklyn	1½	Chassis
		3½	Farm body
Vim	Manhattan Motors Corp., New York	½	Chassis
		½	Express
		½	Panel
White	White Co., New York City.	¾	Estate car
		1½	Screen
		1½	Screen
		3	Steel dump
		5	Chassis
		5	Rack

Total number of makes exhibited	40
Total number of exhibitors of trucks	34
Total number of trucks exhibited	110
Number of stripped chassis	51
Number of express bodies	8
Number of panel bodies	15
Number of dumping bodies	13
Miscellaneous bodies	23

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Big Opportunity Offered in New England's Need for Overland Motor Truck Haulage

Freight Congestion Will Continue for Year or More Due to Railroads' Unpreparedness and Slackened Development

BOSTON, Mass., March 9—Overland motor truck haulage in New England has increased considerably during the past year. This increase has been forced by necessity rather than by a voluntary trend.

Much remains to be done before overland haulage by commercial vehicle in any large area of the New England territory becomes a permanent 365-day-in-the-year service.

Better roads and more of them must be built. After these will come the necessity of keeping these roads clear of excessive amounts of snow during the entire winter so that the speed of the vehicles on the routes will not be hindered to any appreciable extent.

At the present time many of the roads over which motor trucks make regular hauls in the summer time are nigh impassable during the severest months of the winter season and the trucks which should be covering them are either laid up in their garages and overhauled or set to work in a different kind of business where the rigors of bucking snow drifts are unknown.

In many cases where the use of trailers in overland hauls with bulky materials enable the trucks to pull full capacity loads in both directions, the trailers have had to be withdrawn during the early spring months on account of the softness of the roads and in winter on account of the snow.

Both of these conditions tend to reduce the speed of the trucks to such a degree that it is more economical to carry lesser loads at greater speeds than larger loads at smaller speeds. Conditions such as these were encountered by the Warner Bros, Co., which set out to operate a fleet of trucks and trailers between its main plant in Bridgeport and smaller assembling factories in Stamford, Danbury and New Milford, Conn., as described in the leading article in the March 1, 1917, issue of THE COMMERCIAL VEHICLE.

Winter Service Despite Bad Roads

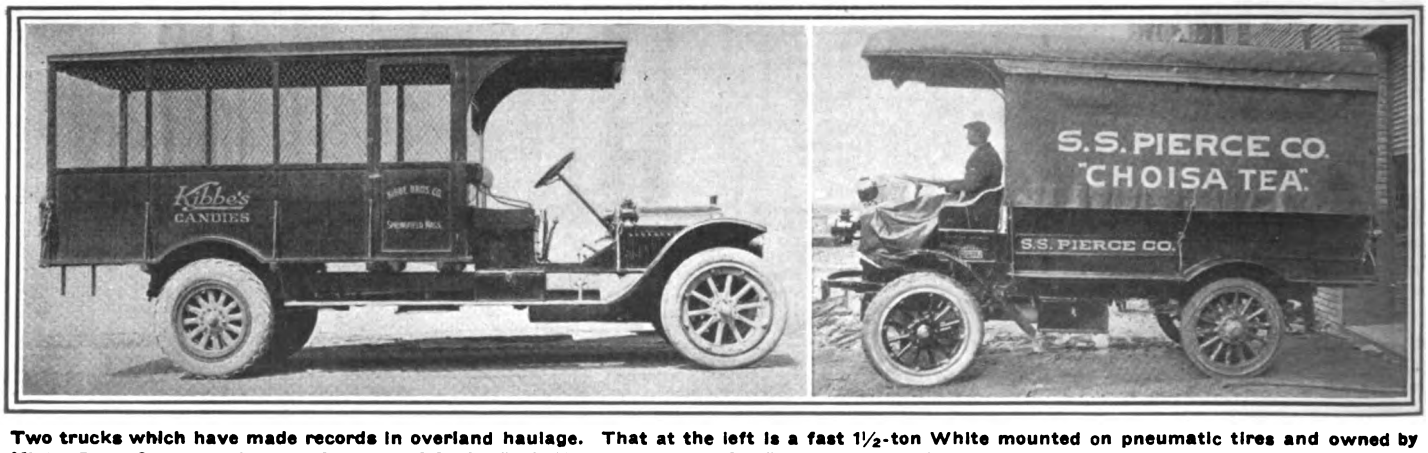
Notwithstanding these poor road conditions met with generally throughout New England, there are many routes between the larger cities and towns which are kept open all winter with the possible exceptions of the periods following extremely severe snow storms. Such roads have good foundations suitable for motor truck traffic and are kept open without great difficulty because of the volume of the combined passenger car and commercial vehicle traffic over them between the large cities and the surrounding points on the main through routes.

Many of such routes between some of the important industrial cities of New England are shown on the large map on the opposite page in which the dotted lines between the cities located indicate the courses followed. The trucks in such service carry a multiplicity of both raw and manufactured goods. In some instances the motors transfer the goods from the points of receipt as at railroad freight yards and boat wharves to the factories, where it is made into manufactured products, while in others the trucks are used to transfer partly-manufactured goods between several plants owned by the same company, in each of which one particular manufacturing operation is carried on.

The increased use of trucks in such work as thus outlined has been due to the freight car congestion along the Atlantic seaboard and the inability of manufacturers of all classes of goods to place any reliance upon the date of receipt of incoming goods shipped by rail from distant points or the date of delivery of finished goods shipped by rail from the main plants of the companies. Frequent embargoes placed by the railroads at irregular periods without sufficient warning have also complicated matters. As a result many manufacturers took their delivery problems into their own hands and installed trucks to replace the railroad service wherever possible.

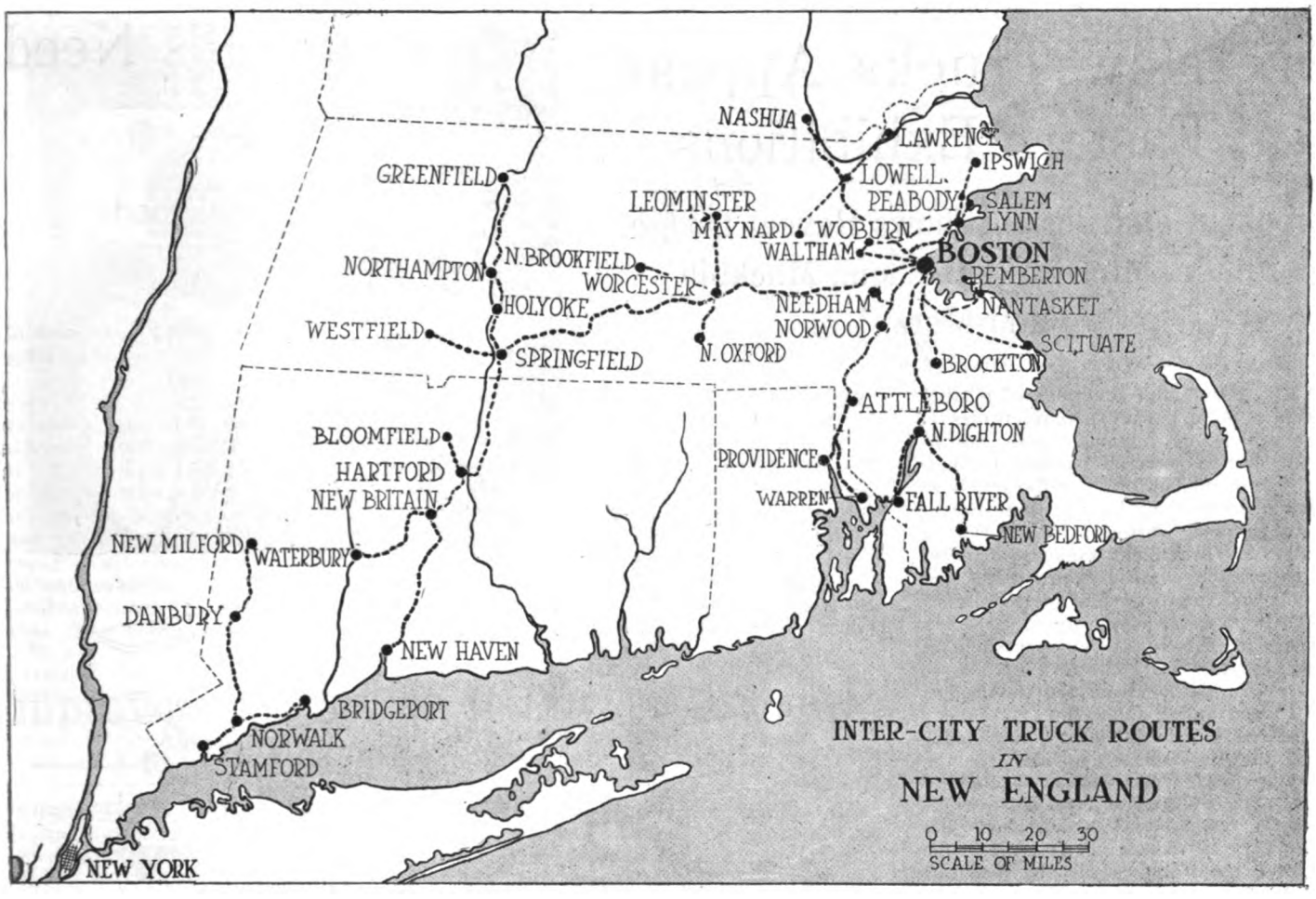
The commercial vehicles put into such work have rendered a good account of themselves. They have ofttimes delivered goods between two points 20 or 30 miles apart at a much lower net rate than by rail, including the transfer charges at both ends of the route in the latter method. Besides, they have rendered a quicker, direct door-to-door service which all manufacturers who must consider the importance of the time element have been quick to take advantage of.

The great importance of the present freight car congestion to the truck user, maker and dealer is not so much that it exists at the present time but that it is more than likely to continue for a year or more, even should the present hostilities abroad cease and the maritime



Two trucks which have made records in overland haulage. That at the left is a fast 1½-ton White mounted on pneumatic tires and owned by Kibbe Bros. Co., a candy manufacturer of Springfield, Mass. It is one of a fleet of trucks which has replaced the railroad for the distribution of the company's product and four-horse wagons for the final delivery to the retailers. The truck often runs as far south as New Haven, about 65 miles distant. The truck at the right is a new 2-ton Autocar owned by the S. S. Pierce Co., a large wholesale and retail grocer of Boston. It was driven overland from the Autocar factory in Ardmore, Pa., to Baltimore, from whence it will carry tea tins from a can factory in that city to the Pierce stores in Boston

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The inter-city truck routes shown in the above map are but a few of those which are now covered, yet they serve to indicate the large territory in which motor trucks have been rendering a service equal to and often better than the railroads could provide, especially in these days of freight car congestion. This railroad congestion is liable to exist for several years, as is explained in the article on this and the opposite page, so that there is still considerable opportunity for a greatly increased use of trucks in overland work in the New England territory. The dash lines between the cities and towns located on the map indicate the routes followed by the trucks

trade of the world be completely resumed. The great industrial growth of the United States within the past 2 or 3 years has been larger than the corresponding growth of the railroads and their equipment.

Following the general business depression before the war and the threats of railroad employes' strikes and an unsatisfactory solution of the rate problem since, the railroads have not progressed in step with the growth of the nation's business. As a result, railroad facilities in general are little better than they were 2 or 3 years ago.

The lack of development in that period is now being felt. Trackage must be increased, additional rolling stock put into service and the terminal facilities improved before railroad shipping will again become sufficient for the needs of the country. Until such time as this occurs the motor truck has a great opportunity to become more firmly established in overland haulage in competition with the railroads. The truck got a good start in this work last September when the threatened tie-up of the Eastern railways opened the eyes of many manufacturers to the many advantages of motor trucks for short-haul shipments.

There is still a great opportunity for the truck user in such work, and especially in New England, whose great industrial beehive of miscellaneous manufactures has been hardest hit because of its proximity to the ports of export shipment to all foreign shores.



Progressive truck merchandising is indicated in the illustration of the overland-delivery schedule of Brockway trucks from the Brockway factory in Cortland, N. Y., to five of the most important cities in New England. The problem of truck deliveries is a serious one in that territory, and while many other concerns have shipped trucks overland from their factories to dealers or distributors in the same territory, it remained for the Brockway organization to devise a simple means of impressing the prospective purchaser with its ability to deliver trucks by the roads in a few hours

As pointed out in the September 15, 1916, issue of THE COMMERCIAL VEHICLE, one of the most important requisites to the success of a truck user in overland haulage is an accurate knowledge of truck operating costs. A complete operating organization is also imperative, and the ability to obtain loads in both directions often means the difference between success and failure. Contract jobs for carrying loads in both directions are not easy to obtain, but they generally can be secured if the truck user is willing to make a thorough study of the truck operating conditions and discover his possible customers at each end of the route.

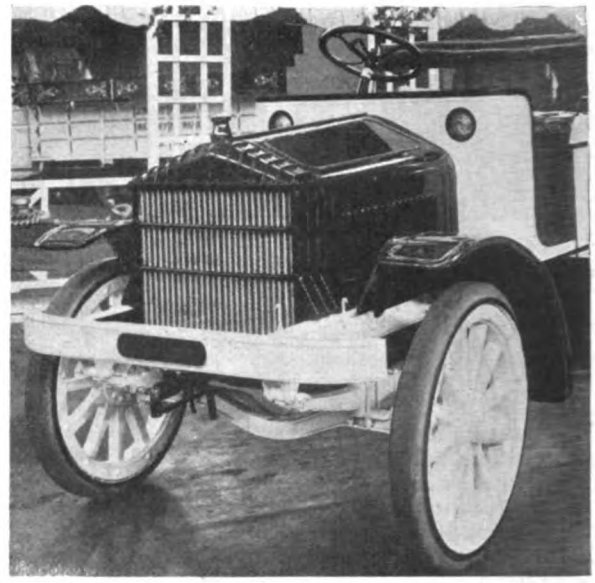
Several examples of overland hauls in which loads are carried in both directions are shown in the map on this page. For instance, R. Wolfenden & Sons Co., Attleboro, Mass., employs one 5-ton Pierce-Arrow to haul woolen yarns from the boat wharves in Boston to the dye mills in Attleboro, 33 miles distant, and then to carry the dyed yarns back to various factories in the outskirts of Boston, where they are made into sweaters.

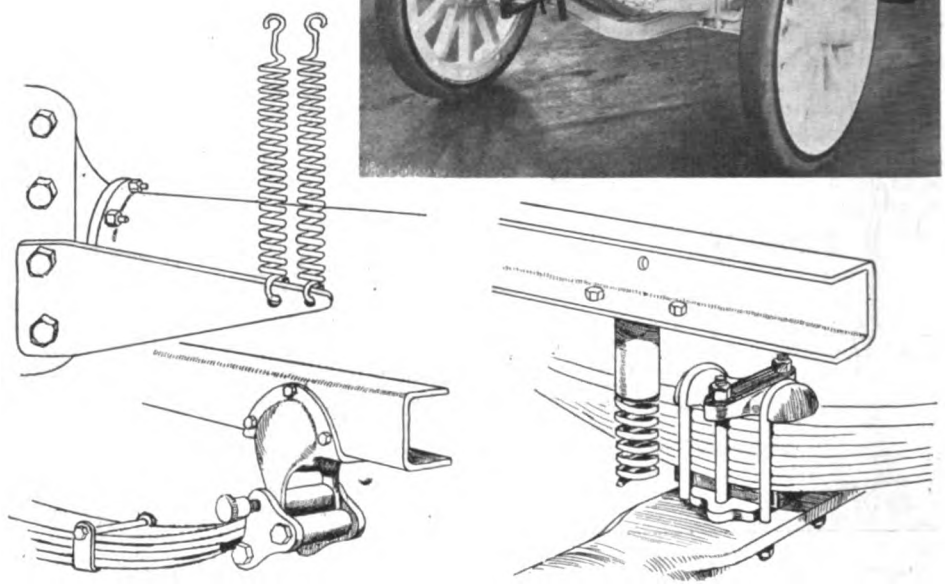
The Warner Bros. Co., Bridgeport, Conn., also carries loads of raw or semi-finished products to its assembly plants in Danbury, Stamford and New Milford by trucks with return loads.

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Six New Trucks Appear at Eastern Exhibitions

Brooklyn and Boston Shows Reveal Dodge, Fulton, Maxfer, Bethlehem, Mackbilt and Metz





New features on the Garford: In the half-tone is shown the improved finned-tube, cast-case radiator, its protecting bars and the new bumper. In the sketch above at the left is shown the simple anchorage for the brake springs. The lower left view shows the double spring-eye at the front end of the rear spring. The remaining sketch illustrates the triple fastening of the rear spring to the axle and the inverted bumper spring

ONE of the chief functions of a truck show is to permit manufacturers of new vehicles to introduce them to the public and for veteran builders to show their new models. Six different newcomers threw their hats in the ring at Brooklyn and Boston. In addition a number of prominent makers of years of experience came forward with new models and improvements in old ones.

Of the new trucks shown at Brooklyn there were three with which readers of THE COMMERCIAL VEHICLE may not be well acquainted. These are the Dodge, the Fulton and the Maxfer.

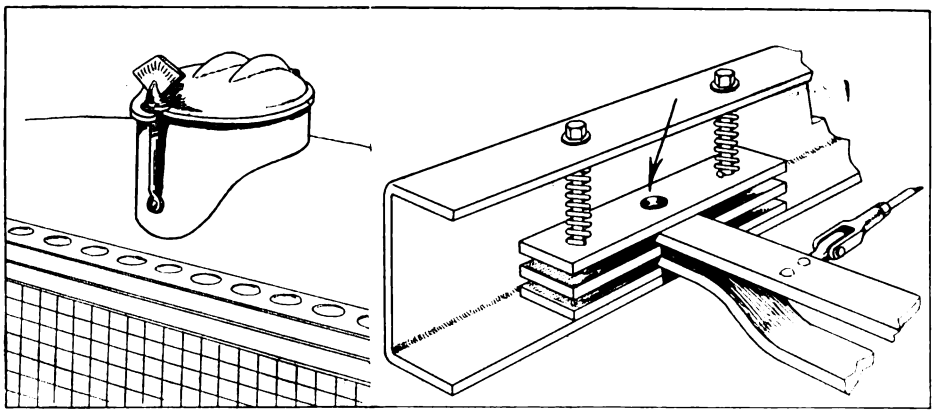
The Dodge is not strictly a new model, being the same chassis as used for the passenger car, fitted with a commercial body. The Fulton 1-tonner, however, is a strictly commercial model, and while it has been on the market for some time is new to most buyers. In the specification tables published last November it was listed as the Clyde, its name since having been changed.

While conventional in some particulars, in others the Fulton is novel. The first novelty to strike the eye of the show-goer was the radiator. This is of the cast-case type with a square-tube core and is shaped so that the central portion is round and somewhat wider than the hood. This is for the purpose of increasing the cooling surface and of permitting the use of a 20-inch fan.

It has a unit powerplant, 3¾ by 4¼ with a dry-disk clutch and three-speed selective gearset. A single shaft with two universals drives the Russel internal-gear-driven rear axle, torque and propulsion being taken by the springs. The frame is made of rolled steel with tubular cross-members. To strengthen the front ends of the rear springs, a double spring-pinning system has been used. In this, the upper leaf is held by a fixed pin and the second eye by a secondary pin supported by two triangular plates dependent on the first.

The fuel tank of the Fulton is mounted on the dash and the rear tires, different from usual practice, are 34 by 2½ duals.

The Maxfer truck is built by the Maxfer Truck & Tractor Co., Chicago, which formerly made Ford adapters only. While not discontinuing the former product, in the new truck, the company has launched out upon a new line. The truck is a 1-tonner of standard type and features a complete electrical equipment. Its unit powerplant comprises a 3½ by 5 block-cast engine, a cone clutch and three-speed gearset, driving through a shaft with two universals to a worm-driven axle with a self-locking M. & S. differential. Hotchkiss drive is used through springs unusually long and flat. The two-unit Dyneto starting and lighting system is used, the starter having bendix drive. Tire equipment is pneumatic in front and solid in the rear.



Detail refinements on Larrabee chassis, radiator cap at left and locking brake wrench slide at right

Four New Trucks at Boston

Like the Brooklyn show, that at Boston also stood sponsor for two brand new trucks made by recently-formed companies. These were the Mackbilt and the Bethlehem, the former exhibited in Horticultural Hall, the structure several blocks away from the main show in which the overflow displays were shown. In addition to these two, the new Metz 1-tonner was shown for the first time along with the Metz passenger car exhibit. The new Maxfer 1-ton truck described above also made its debut to the

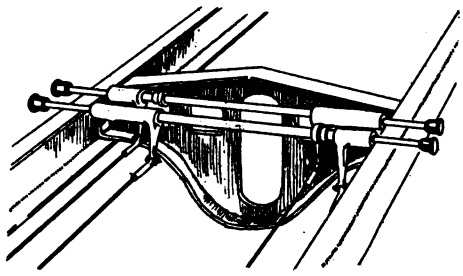
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New England motor truck-buying public.

The Bethlehem shown, a 2¼-ton chassis, with internal-gear final drive, was fully described and illustrated in the February 15, 1917, issue of THE COMMERCIAL VEHICLE.

The Mackbilt, also described elsewhere in this issue, is a ¾-ton truck of conventional design.

The Metz, also a 1-tonner, sells at the remarkably low price of $695 in the chassis and is characterized by the incorporation of the familiar Metz friction change-speed mechanism with an internal-gear-driven rear axle. The driving and driven discs, together with the shaft on which the latter is slidably mounted, are carried on a special subframe pivoted to the side frame members at the front just aft of the motor, and at the rear to clamps around the dead rear axle. The latter and the live axle, on the ends of which the small internal spur gears are mounted, are kept in their proper relative position by means of the two end subframe clamps and an additional one near the center of the dead axle. The driven disc is manipulated from a center control lever in the cab to give seven speeds forward and one reverse.



Brake rocker shaft on Sterling, showing arrangement for outside greasing

The Metz is offered in but one model with a wheelbase of 130 inches and a clear loading space behind the driver's seat of 8 feet. It is equipped with a four cylinder L-head motor, with the cylinders cast in block and a bore of 3⅞ inches and a stroke of 4 inches. Ignition is by a Splitdorf magneto and lubrication by the splash system. Pneumatics, 31 by 3½, are fitted as standard in the front and 32 by 3½ solids in the rear.

Improvements Shown to Buyers at Shows

Opportunity to Study Construction Afforded

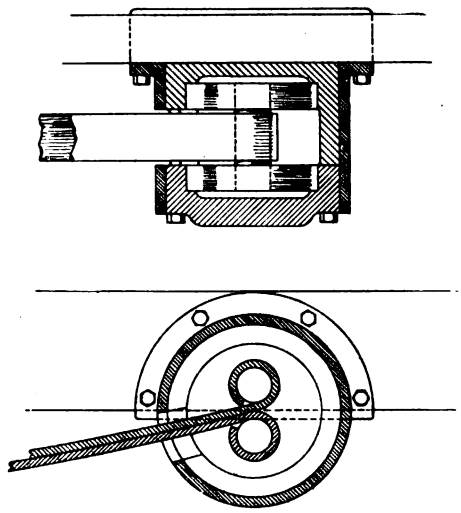
COMMERCIAL vehicle shows afford one advantage that is difficult to attain otherwise. This is the opportunity afforded truck buyers of seeing the improvements in construction which are constantly being made. To merely convey the information by the printed word is not enough.

At Brooklyn, important changes in Garford trucks were revealed for the first time. The entire design of the front end has been improved considerably by the adoption of the finned-tube type of radiator in a cast casing, by the addition of a substantial steel bumper and the application of bars across the front of the radiator to protect the core. The core is of the vertical helically-finned type and the cast casing is built up, carrying deep fins on the upper tank to carry off the heat. Two stout iron bars are bolted to the sides of the casing, extending across the radiator and the bumper is laid across the spring-horns.

In the rear system, important changes have been made. The Hotchkiss drive, which is used on the small worm-driven types, has been strengthened by the adoption of the double-eye form of front pinning. It is at this point that propulsive stresses come and therefore additional strength here is desirable. The main leaf encircles the usual fixed pin, held by a robust frame bracket. To either side of this pin are swung triangular plates, carrying two additional pins. One of these is forward and slightly below the main pin, and carries the eye of the second leaf, which extends forward. The third is below the spring and serves as a retainer for the two plates.

To further strengthen the front part of the spring, three rebound clips are used. The middle of the spring has also been reinforced. The spring does not rest directly on the spring pad of the axle, but on a metal block. At the top is another casting to serve as a hold-down. This has grooves to take the U-bolts which pass through the spring perch, being shaped to take the easy arc of the bolts, this shape of bolt being stronger than the type which has a flat bend at the top. As an additional safeguard there are two additional bolts at the middle.

An unusual disposition of the bumper spring has been made, for instead of mounting it on the axle or the top of the spring with a special plate on the frame, it is inverted, being carried directly underneath the frame and acting on the extended surface of the spring perch. It is a coil spring of rectangular section.



Ingenious form of double spring pinning used on the Netco for added strength for Hotchkiss drive stresses

A neat disposition of the brake-rod return springs has been made in the new Garfords, a triangular plate being inserted under the nuts that retain the worm-gear housing of the axle, into which the springs are hooked, as shown in the sketches.

To facilitate proper lubrication of parts often neglected, Sterling trucks have a neat arrangement of grease cups on the brake rocker shafts. These are laid within the frame members, but short tubes extend from their ends to grease cups outside the wood body sills so that they may be turned up while standing at the side of the truck and without stooping.

On the Larrabee chassis there are two small features of great merit, a radiator cap that is easily opened and a novel means of locking the differential. The radiator cap is of the hinged type, oval in shape and retained by a thumb-screw. It is large enough to permit of pouring the water in from the lip of an ordinary pail, thus dispensing with the funnel. The thumb-screw is diamond-shaped, being a reproduction of the Larrabee trademark.

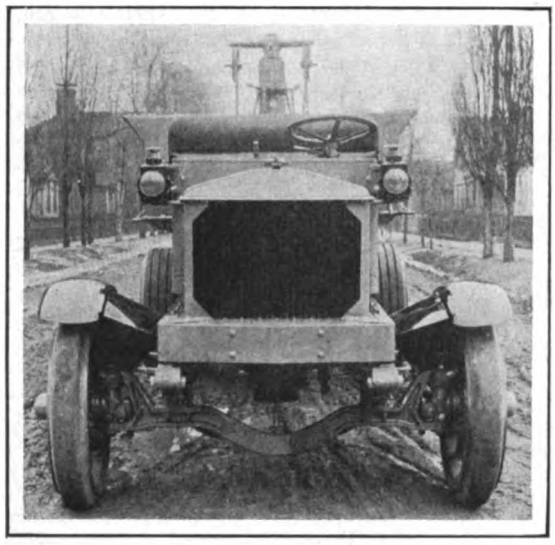
The differential locking means is unique in that it employs the brake to stop the spinning of the wheel which has lost traction. It is obvious that if one wheel has lost its traction, the other wheel cannot pull the truck out regardless of how much traction it may have, for the differential will merely transfer the power to the spinning wheel. Accordingly the Larrabee designer has arranged for the application of the brake to the spinning wheel, preventing it from turning and therefore diverting the power to the other wheel.

This is accomplished without additional complication by dropping a short pin or bolt into a hole in the slide in which the brake eveners slide. The pin is placed on the side whose wheel has traction and prevents the brake on that side being applied.

One of the most interesting details of refinement seen at the Boston show was a new method of supporting the front ends of rear springs designed on the Hotchkiss principle to take both the propulsion and the driving torque. The device makes use of the top and second leaf of the spring to take the torque and driving stresses instead of only the top leaf.

It consists of a cylindrical casing bolted to the side of the truck frame and carrying two circular disks turning freely inside of it. Each disk has two holes in it in which pins through the looped ends of the top and second leaves of the spring are inserted, as shown in the illustration on this page. The distance between the centers of the two bolts through the spring ends and its tendency to act as a lever to force the springs apart when under stress is relieved by the fact that the two disks may revolve slightly in their seats. The casing is cut away at the rear as shown to permit the spring leaves to pass through.

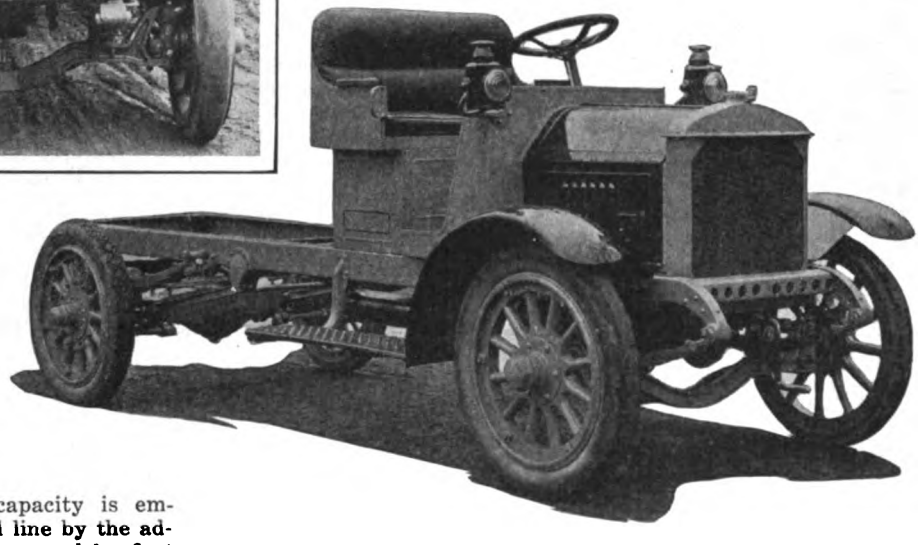
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Above, new Federal 5-tonner head-on, showing characteristic lines despite unwonted massiveness

Federal Line Expanded to Five Chassis Models

Five Sizes from 1 to 5 Tons—Own Engines and Gearsets Applied



The 1-tonner, also a new Federal size — at least in late years, giving an idea of the steel dash construction

GREATER range of capacity is embodied in the Federal line by the addition of new 1- and 5-ton models, first exhibited at the Boston show, but specified in the specification table published in THE COMMERCIAL VEHICLE of Nov. 1, 1916. Typically Federal in plan, the new sizes nevertheless contain departures of interest. Previously the Federal has always been an assembled product, employing standard components throughout. The new line, however, registers the entry of this veteran house to the class of semi-manufacturing firms, since both engines and gearsets are now special designs used exclusively on these trucks.

The engine and the gearset are Federal products. Five models are now offered, the previous 1½-, 2-, and 3½-tonners and new 1- and 5-tonners. The older models have undergone considerable change in the use of Federal gearsets and engines. The new 1-tonner marks a departure from previous Federal practice in its use of pneumatic tires as optional equipment and the absence of the governor to permit the higher speeds desirable in a light job. In the heavy fellow, too, there is a departure, since Smith hollow cast steel wheels are here introduced first to Federal purchasers.

FEDERAL SPECIFICATIONS

Capacity, lbs.	2,000	3,000	4,000	7,000	10,000
Price	$1,650	$2,100	$2,300	$3,000	$4,000
Wheelbase, in.	132	144	120*	156†	156†
Tires, front	34x3	36x3½	36x4	36x5	36x5
Rear	34x4	36x7	36x5d	36x5d	40x6d
Bore, in.	3½	3¾	3¾	4½	4½
Stroke, in.	5½	5½	5½	5½	5½
N.A.C.C. hp	19.61	22.50	22.50	32.40	32.40
Speed, r.p.m.	1245	1190	1125	1150	1150
m.p.h.	18	15	13	12	10
Gear-ratio in high gear	7-1	8½-1	9½-1	10½-1	13½-1
Final drive	worm	worm	worm	worm	worm

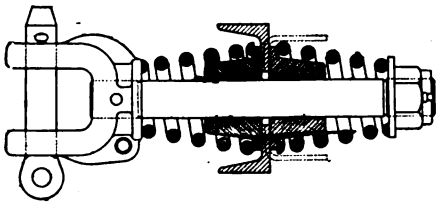
*144, 156 and 168 optional. †180 optional.

In all models the engines are supported direct from the mainframes at three points, separate from the gearbox. Three sizes are used for the five models, the 1-tonner having a small model, the 1½- and 2-tonners a medium size and the 3½- and 5-ton sizes the largest size. All are block-cast with inclosed flywheels.

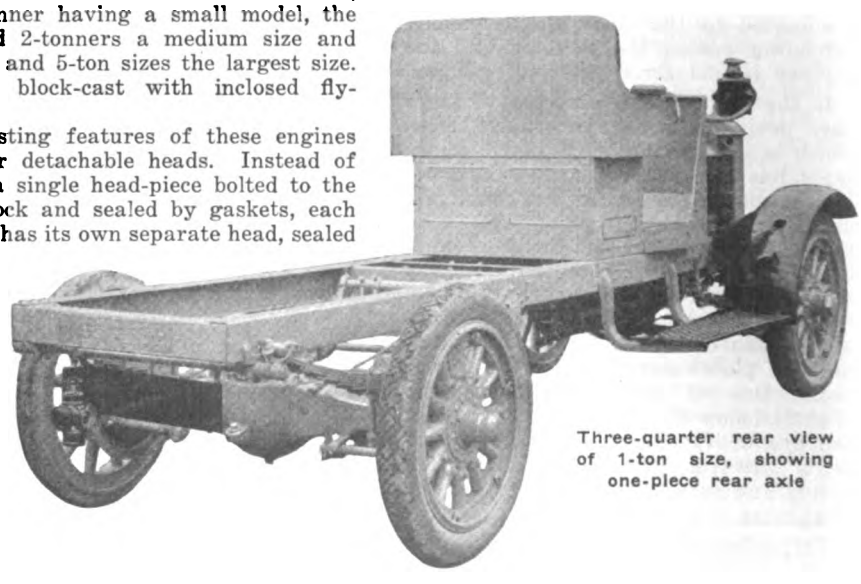
Interesting features of these engines are their detachable heads. Instead of having a single head-piece bolted to the main block and sealed by gaskets, each cylinder has its own separate head, sealed by a simple round gasket. A deep flange on these heads fits down into the cylinder for some distance. The fit is a ground one, so that practically a mechanical seal—tighter, even, than that of the rings—is secured. The gaskets above, therefore, are mainly called upon to hold the water. They all have five-bearing crankshafts and waterjackets which extend down to the crankshaft.

All of these features make for heavy-duty capabilities, by which the engine may be run at continuous speed for long periods without undue heating or wear of the bearings and without overheating of the cylinders.

But there have been other considerations. Accessibility is promoted by hav-



Draw-bar applied to new Federals and Federal tractors when trailers are to be drawn



Three-quarter rear view of 1-ton size, showing one-piece rear axle

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ing separate heads to the cylinders and separate valve plugs. Hand-hole plates between the cylinders and lower crankcase half permit access to interior parts without removing the lower half, when the reason for access is not serious. Crank-pin bearings are made easily adjustable by the use of laminated shims, instead of the solid type.

By the removal of this plate the connecting rods may be disconnected and the pistons and rods drawn out through the cylinder heads.

Lubrication is of the pressure type, there being no splash, all interior running parts being oiled by pressure up to 50 lb. per sq. in. at 1,200 r.p.m. The cylinders and other rubbing surfaces derive lubrication from the mist thrown off of the connecting rods.

Carburetion of our fuels of increasingly low volatility has been considered by the designers with the result that the inlet pipe is bolted to the cylinder block on the non-valve side, the manifold being cored within the casting, so as to preheat the charge.

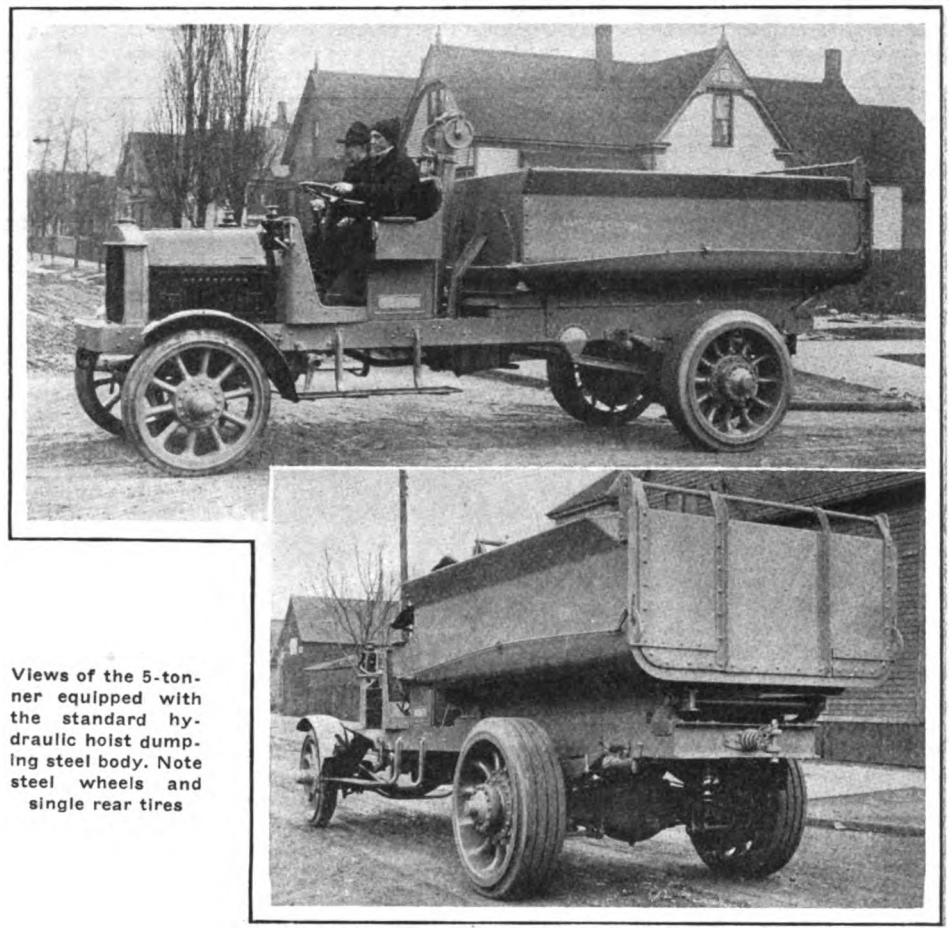
Cooling circulation is by a centrifugal pump through a radiator with vertical helical finned tubes, and a casing of Parker Rust-Proofed pressed steel. There is a Simplex governor, driven from the timing gears.

Single ignition with fixed spark advance is afforded by an Eisemann magneto and Westinghouse starting and lighting equipment is applicable at extra cost.

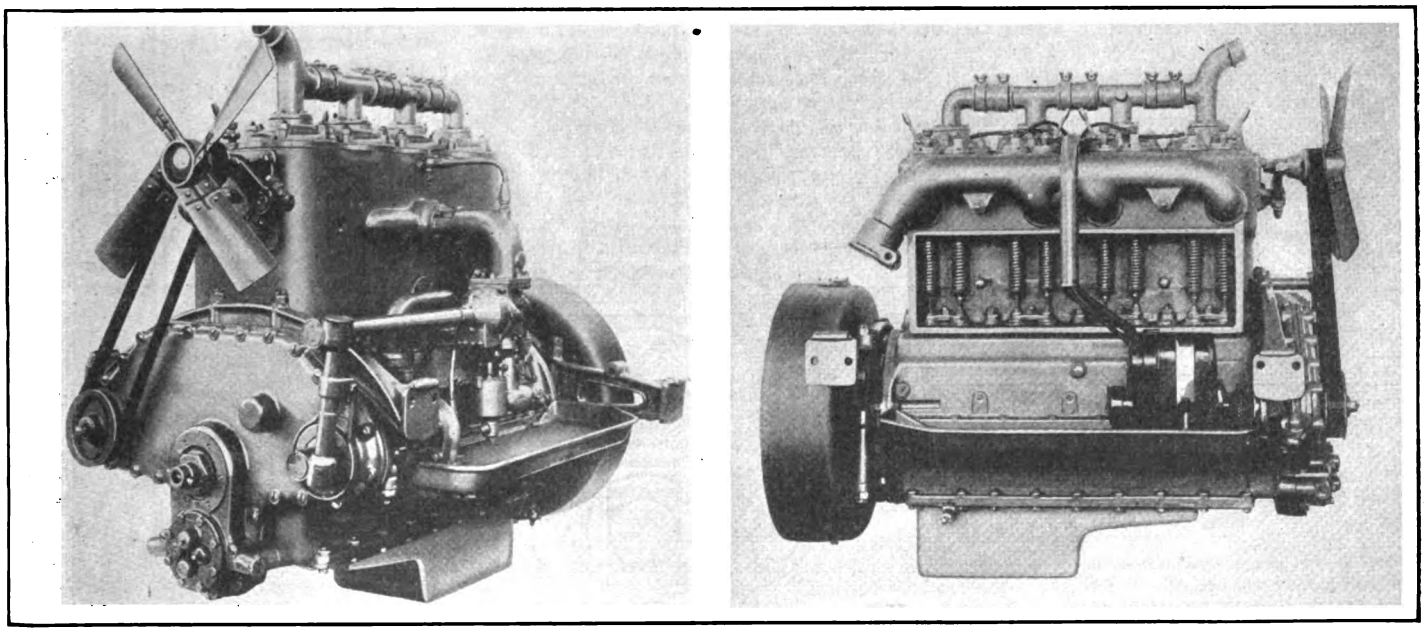
Borg & Beck dry-plate clutches are employed on all models. On each, between the clutch and the gearbox, is a primary driveshaft with two universals, a secondary shaft with two more universals extending to the axle.

The gearbox on each model is of the four-speed selective type, save on the 1-tonner, which has but three speeds. A sectional drawing of a typical Federal gearset is reproduced on one of these pages. These gearsets have ball bearings throughout, except at the front end of their mainshafts, where roller bearings are located. Compactness has been secured by extending the teeth of the master gear beyond the layshaft driven gear, these teeth forming the male member of the direct drive jaw clutch of robust proportions, the female member being internal teeth on the third-speed mainshaft sliding gear in the case of the four-speed designs, and the second-speed gear on the three-speed one. The sliding gears are on splines instead of a square, six being used on the shaft.

Tubular driveshafts are used. The rear axles are all of Timken manufacture, of the floating type, fitted with the regular duplex internal brakes. Brake sizes have been increased, the size formerly used on the 3½-tonner being at present employed on the 1½-ton model, with corresponding increases on other models. Torque in each case is taken by the springs, but radius rods are employed for propulsion, even

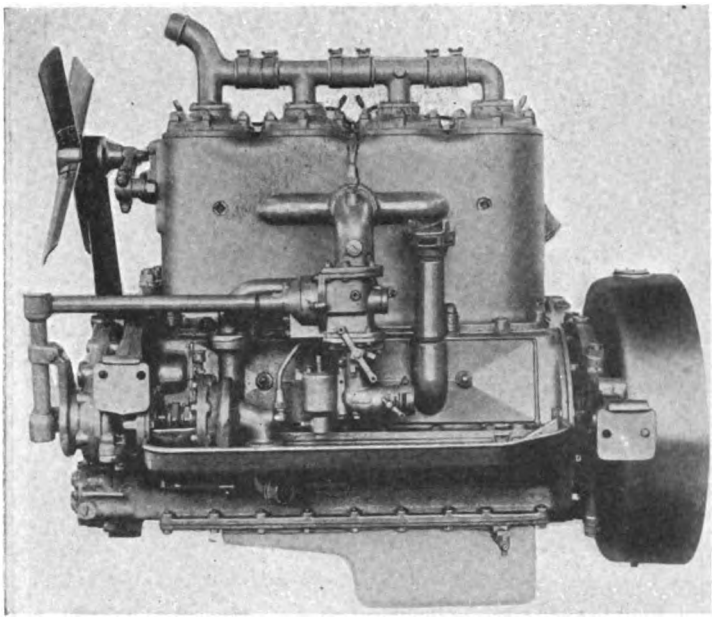


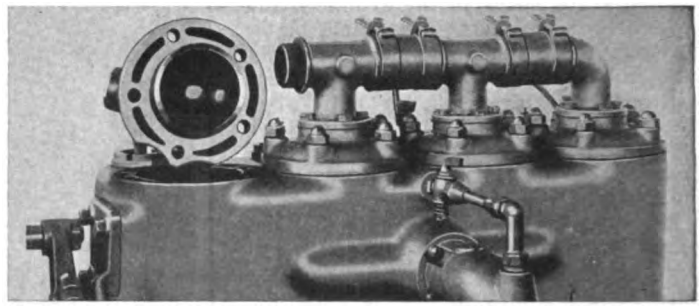
Views of the 5-tonner equipped with the standard hydraulic hoist dumping steel body. Note steel wheels and single rear tires



Front and side views of the 5-ton engine. Note compact timing gear grouping, web at side of crankcase and connection of carbureter and governor to cylinders. Note also accessibility of valve tappets and magneto

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Inlet side of the 1-ton engine, at the left, and detail of the separately-detachable cylinder heads, above

on the smallest model, this marking the abandonment by the Federal company of Hotchkiss drive. The radius rods are malleable steel castings of I section, having ball joints at the rear, to take care of twisting action.

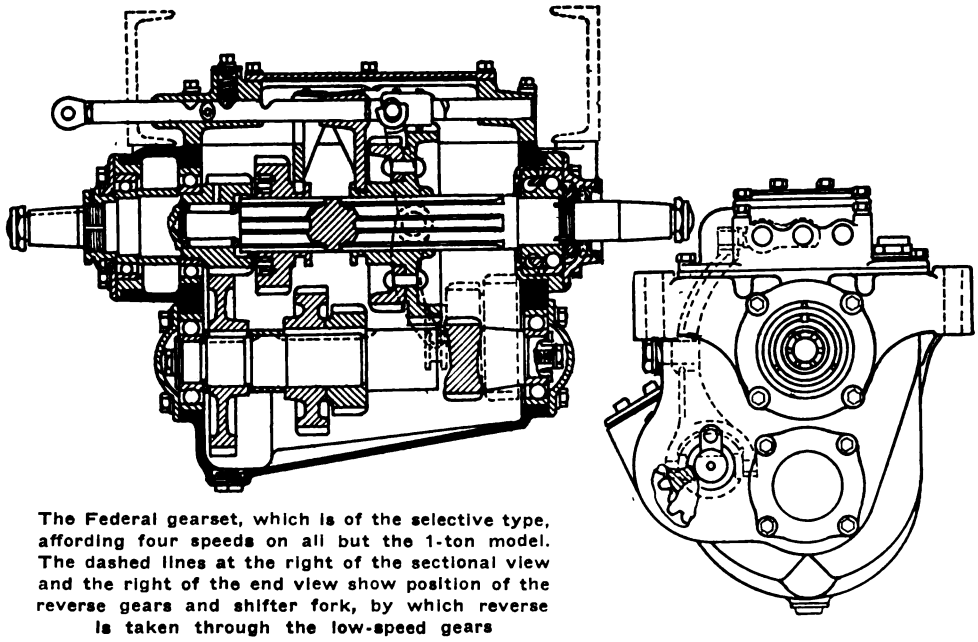
Federal frames are of pressed steel on the small and medium sizes and of rolled channel stock on the 3½-ton and 5-ton models. Vanadium steel springs are employed, ranging in length from 40 in. in length on the three smaller models, at the front, to 44 in. on the two larger, and on the rear, 52 in. on the 1-tonner, 54 on the 1½- and 2-tonners, and 56 in. on the largest jobs. The rear springs are supp rted from rods crossing the frames and flexibly mounted on the channels. Grease cups are not used on the springs, but oil cups instead.

In tire equipment important options are offered. On the 1-tonner, the regular tire equipment is solid, but at an extra charge of $25 pneumatics, 35 by 5 all around, will be fitted. The 2-ton model carries single tires as standard, in the rear, but on option 36 by 4 duals will be applied. The 3½- and 5-tonners are regularly equipped with dual rears. At $40 extra the 3½-tonner will be equipped instead with 36 by 10 rear singles and at $60 extra 40 by 12s will be applied to the 5-ton size.

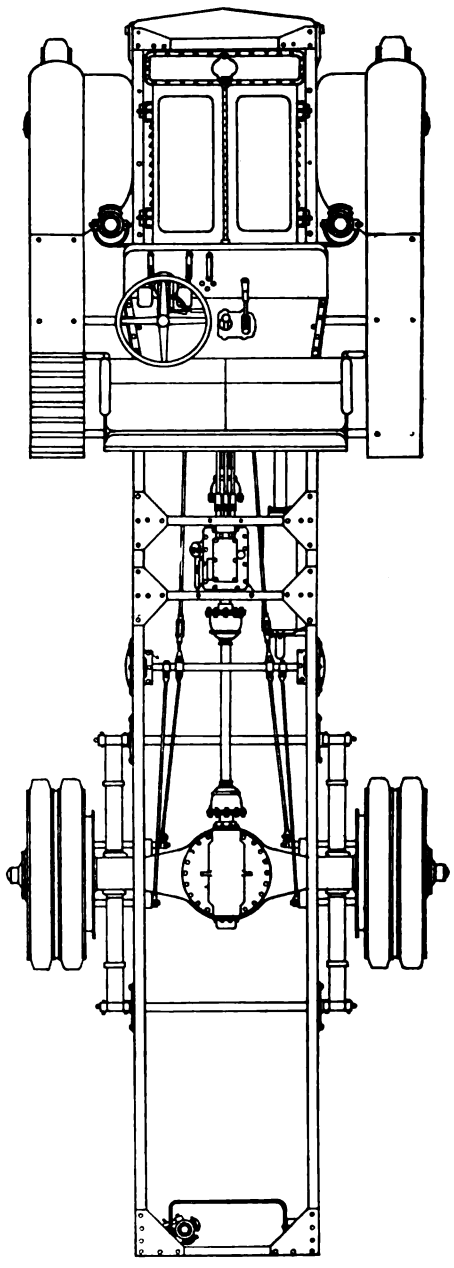
Interesting examples of detail refinement are afforded in the fuel tanks, of 20 gal. capacity on the three small sizes and of 28 gal. on the big ones. These are of drawn steel, placed under the seats, having a flange, carrying the shut-off valve and drain cock and trap. An extension control permits the shut-off to be operated outside the frame.

The seat is all steel with a fully upholstered back, and in the 3½- and 5-ton models it has divided cushions to accommodate three persons. The dash and toe boards are pressed steel, as are also the fenders, which are of the crown type, with apron. Pressed steel is also used for the running boards and hangers. The running boards are filled with hard wood.

Two tractor models are furnished on the 1½- and 3½-ton models. These are mounted on a short wheelbase and are equipped with a turntable or rocking fifth wheel, made with a special bracket for the Federal trucks. A neat form of draw-bar has been mounted on the rear of these and is illustrated in an accompanying drawing.



The Federal gearset, which is of the selective type, affording four speeds on all but the 1-ton model. The dashed lines at the right of the sectional view and the right of the end view show position of the reverse gears and shifter fork, by which reverse is taken through the low-speed gears



Plan view of 5-ton chassis, showing midships gearbox location and heavy bracing of the structural steel frame at its middle, with contrasting flexibility at its rear portion

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Development of Laggard Zones Rendered Possible By Motor Progress

COMMERCIAL vehicles and agricultural tractors are destined to open another new world to the development of commerce and industry. The tropics have languished while the hardy peoples of the temperate zones have accomplished miracles. We, in our invigorating climate have found it necessary to substitute mechanical for muscular power in transportation. How much greater then is the need in the wilting equatorial clime. The tropics are largely unroaded, furthermore, and railroad development is in its infancy. When the temperate portions of South America were developed, the railroad was stretched as a network over Pampas and Llanos—the then only method of applying power to land transport. In the new development of the only remaining tenable wildernesses it will be the traction vehicle of the road, not the railed car of the right-of-way, that will fetch and carry for the builders of a new world. One requisite, however, will be good roads and lots of them. The track-laying tractor will do for a pioneer, but it must be followed by the road-making crew to render possible the economical application of the motor truck.—EDITOR.

"Geography and Commerce"

By O. P. Austin*

INDUSTRIAL and commercial development of the tropical half of the world may be one of the most important results of the present war. The tropical sections of the world now supply but one-sixth of the world's international commerce, although they have one-half of its area and one-half of its population. The area lying between the thirtieth parallels of north and south latitude, all of which is tropical or sub-tropical, has 800,000,000 people on its 25,000,000 square miles of land surface, while the temperate areas have 850,000,000 on 25,000,000 square miles of land surface. Yet the international commerce of the tropical half of the earth's surface is but $6,500,000,000 per annum, while that of the temperate area, with an equal population and land surface, is $33,000,000,000, these figures representing international trade in 1913, the year immediately preceding the war. The international commerce of the tropical half of the world's area, exclusive of the polar regions, averaged $260 per square mile, and that of the temperate area $1,300 per square mile. The commerce of the tropical section averaged $8.00 per capita for its entire population, and that of the temperate section $39.00 per capita.

This failure of the tropical sections of the globe with a greater producing power per acre or square mile than that of the temperate zones is due primarily to lack of facilities for transporting products from their place of production to the common carrier, whether railway or steamship. This service of transporting products to the common carrier was rendered in the development of the temperate zones by the faithful horse, whose place is now being taken by the commercial vehicle and in the roadless areas by the caterpillar tractor, but this service of the horse which developed the temperate zone could not be rendered in the tropics by reason of the inability of animal power to cope with climatic conditions. Hence the comparatively slow progress of development of production and commerce in the tropics during the last century, in which world development of industrial and commercial activities has increased international trade from 1½ billion dollars in 1816 to 45 billion dollars in 1916, most of this great growth having occurred in the temperate zone half the world over.

Capital, which is already sending steamships to the ports of the tropical areas the world over, stands ready to construct railways to develop the interior of that half of that area just as it has done in the temperate zone half, but railways are useless unless the natural products can be moved from the place of production to them, and this has thus far been impracticable in the tropics because of the inability of animal power to render in that climate the service which it gave in the development of the temperate zones.

As a result of this condition in the past, the railways of the tropical or sub-tropical half of the inhabited world total but 112,000 miles, while those of the temperate half are 638,000 miles. The world has, outside the polar regions, 750,000 miles of railway, and 50,000,000 square miles of land surface, or an average of 15 miles of railway to each 1000 square miles of land area, but the railways are so unevenly divided between the temperate and tropical sections that the tropical half has but 4½ miles of railway for each 1000 square miles of land surface, while the temperate zone half has 25½ miles of railway for each 1000 square miles of land surface.

That the growth of commerce is dependent upon the presence of railways for land transportation goes without saying, and that railways cannot perform their service without the co-operation of animal or mechanical power in transporting products from the farm, forest, mine or factory, to the railway, is equally apparent, and with animal power unable to perform this service in the tropics, that half of the world has had to await the development by man of a system by which mechanical power can perform that service.

This factor, necessary for transportation in the tropics between the place of production and the common carrier, has apparently been brought into practical operation by the necessities of the war. Necessity, it is said, is the mother of invention, and while man had invented the motor car and the flying machine before the beginning of the war, he had only begun to realize their practical value, and especially the practicability of operating the horseless vehicle over undeveloped and roadless areas.

But the necessities of the war have sharpened his wits, and to-day millions of men and untold quantities of merchandise are being transported by American and other horseless vehicles over sections of Europe in which, however good their roads may once have been, they can no longer be relied upon as highways for this necessary transportation which goes on day and night and with an activity heretofore undreamed of.

The necessities of the war taught man the practical use of the horseless vehicle for transportation of men and merchandise on land and of the flying machine in the air. While he had begun to make the acquaintance of the horseless vehicle and the flying machine prior to the war, he did not realize the capacities of either for practical daily and hourly use as he does to-day and will still further realize at its close, and there seems no good reason why the lessons which he has thus learned in war should not be applied to the arts of peace in the development of that great undeveloped area, the tropics, for whose products the temperate zone is clamoring, as is evidenced by the fact that over $1,000,000,000 worth of tropical products were brought into continental United States in the year just ended.

That area lacks only transportation facilities, capital and industrial experience to make it as productive and prosperous as the other half of the globe, and the temperate zone stands ready to supply these so soon as the lacking factor of local transportation facilities can be supplied. The exports of the tropical belt, consisting of foodstuffs and manufacturing materials, go to the temperate zone countries; the imports, chiefly manufactures, are drawn from the north temperate zone.

It is just 100 years since Daniel Dod, a Virginian, builder of steam engines, came to New York City, and co-operated with Francis Fickel, a builder of sailing vessels, in the construction of a steamship, the *Savannah*, which in 1819 showed to the astonished world the possibility of crossing the ocean by steam power, and the railway experiments then in progress resulted in the establishment in 1820 of the steam railway. In the 100 years since that time world international commerce has grown from $1,500,000,000 to $45,000,000,000.

The future possibilities of the horseless vehicle for transportation of merchandise may be as great to-day as were those of the steamship and railway a century ago. If the practical development of the horseless vehicle for land transportation and the flying machine for exploration, travel and communication should render practicable the commercial development of the tropical half of the world's land area, their value to man would far exceed the cost of the war, in which their practical qualities have been made apparent.

*Statistician, National City Bank of New York. Address delivered before the New York Chapter, American Institute of Banking, February 21.

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The Passing of An Impassable Pass

By John Grant



WITH ROPES ON THE WHEELS THEY MADE IT WITHOUT MUCH DIFFICULTY THROUGH 8 INCHES OF SNOW

NATURALLY, BY MOTOR TRUCK

BEAR Valley, 7000 feet up in the San Bernardino Mountains, is a southern California mountain land reached by the road known to motorists the world over as The Hundred and One Mile Road on the Rim of the World.

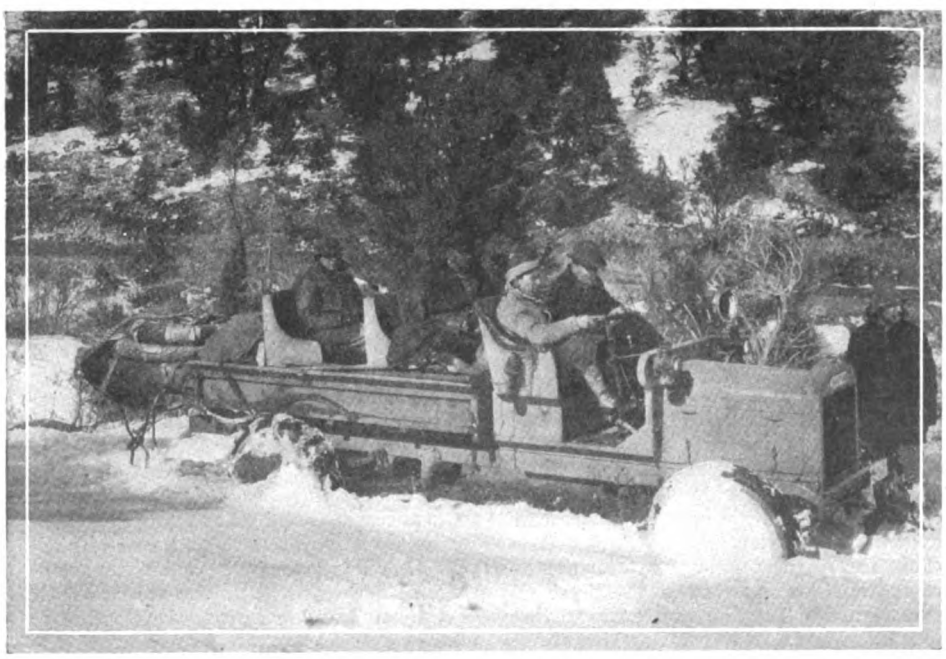
Motor transportation has made its scenery and its remarkable rainbow trout fishing accessible to the whole population of Southern California in something like a long single day's drive in summer.

C. L. Smith, Southern California's veteran trout fisherman, the man whose catch is oftenest worthy of exhibit in the sporting goods store windows, is an authority on the former inaccessibility of Bear Valley. He says: "Five years ago"—mark the short period—"I met some men at Redlands who were enthusiastic about trout fishing. They told me about some wonderful fishing country, which they said was way back in the mountains. Old trappers and prospectors came out and told remarkable tales of this country, its beauties, its extreme ruggedness, and the size and gameness of the trout. The country was only open for a few months of the year on account of the deep snow.

"Then it was necessary to take a heavy pack train, and have a good-sized party with shovels and axes. In a couple of weeks they could work their way in there, but it was a month's trip to get in and get any fishing and to get out. I determined some day to organize an expedition and hire a pack train and get into this country. You can imagine how speedy the progress of the motor vehicle and good roads in these mountains has been. Following things along last year I found myself going to Bear Valley in a machine with my friends. Sitting by the camp fire in the cool evening of 7000 ft. elevation I fairly gasped with astonishment.

" 'Why,' said I, 'this must be that country we have always been going to pack into with mules. It can't be anything else, and just think of it,—here we are actually in the midst of it and we have come in a motor car.' And, of course, we verified the point and it was a fact that our inaccessible wonder country of 5 years ago was the Bear Valley that has been brought into Southern California by the Rim of the World route and the desert road via Victorville."

So much for Bear Valley in summer and what the motor truck has done for it to make it accessible by bringing in supplies, and the passenger car by bringing in campers and fishermen. In winter Bear Valley still presented the fierce inaccessibility of the polar regions. On 2 successive years a sturdy crew of motorists has won a trophy by being the first to dash into Bear Valley in a passenger car. This winning has always been made late in March. If you go to the movies you will know why. All the Northern Forest plays showing the giant pines and deep snow and foaming and ice-bound rivers and fur clad trappers and Indian maidens and even Esquimaux, to say nothing of the interesting husky dogs—



"THERE IS NO GASOLINE CRITTER MADE THAT HAS PUNCH ENOUGH IN ITS GUTS TO BUCK THEM ALL-FIRED DRIFTS" (sic)

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these bits of so-called Alaska and would-be Canada are nothing more nor less than Bear Valley. The scenes are invariably taken in late spring or early autumn. Only a few hardy old settlers have remained in Bear Valley through the winter the past 2 or 3 years since it has become a settlement.

The motor truck is to work a still more wonderful transformation. The idea has been conceived and the fundamental experiment has been made and pronounced a success by the experimenter. Bear Valley, a great winter resort, has been the dream of William Cline, one of the prime movers in the development of athletic, forest and water sports in Southern California. The life-long dweller in the land of sunshine where the grass is green and flowers blossom out-of-doors all winter naturally reads with envy of the joys of skating, the thrill of flashing down the hillside on swift running skis, joy of the snowball fight. He feels in imagination the rush of cool air on his cheek as he slides down a giant mountain side on a toboggan.

The Southern California tourist in mid-winter has his days when he would enjoy a dash into a colder climate. With Bear Valley a day's journey in summer, winter inaccessibility seemed unendurable. Cline watched the attempts of cars to break through, then he started to interest people and put up a cup for the first truck after a violent storm to reach Clinemiller in Bear Valley.

On Saturday, Feb. 17, in the middle of the worst February rainstorm Southern California has known in years, a party assembled for a dash to Bear Valley in a truck. Of course the rain in the valley was a violent snowstorm throughout the mountains. The party in the 1½-ton Moreland truck with Goodyear pneumatic tires included C. H. Smith and M. W. Ferguson of the Moreland factory, F. H. Whatley, Jack Griffin, manager of Ascot speedway, E. F. Spencer and William Cline, the donor of the cup. If the truck showed that it could buck the snowdrifts through to Bear Valley, immediately the word would go out to sportsmen and tourists that Bear Valley is a year-round resort. It would be the start of a campaign such as led to the building of the Rim-of-the-World route, which will culminate next year in developments which will assure a continuous activity in winter sports within a day's motor ride of the great hotels where millionaires play golf on green turf through December, January and February.

As the little Moreland sped over the boulevard through the great Southern California Valley to San Bernardino, it had a foretaste of its coming fight in a hail storm, rare indeed in this locality. A 9-mile grade to the summit of Cajon Pass was negotiated without difficulty and the truck was in the Mojave desert, passed the little settlement of Hesperia and the thriving oasis town of Victorville and up between the foothills.

When night came they stopped at Cactus Flats, where the whole party spent the night in a one-room cabin of Cactus Johnson, a venerable mountaineer who has spent 46 years in this wilderness. He gravely assured the boys that what he knew about the Big Bear snows amounted to much more than what they knew about the truck and "there was no gasoline critter made that had punch enough in its guts to buck them all-fired drifts." So the party sat and played cards with the old man and listened to his discouragement until a late hour and then, fully prepared for the worst, made an early start into the famous Cushenberry Grade.



AS SOON AS IT HIT THE SMOOTH ICE PROGRESS WAS ALL OFF UNTIL THE ROUGHENERS GOT BUSY AGAIN

To their surprise, with ropes on the wheels they made it without much difficulty through 8 inches of snow. The next was Johnson's Grade, named after the old man, which he had taken a personal pride in declaring would be too much for them. When they were half way up they saw two men below waving to them strenuously. They had come out of their camp to warn the truck to come back. They assured its crew that the road was impassable. Their own machine was stalled in there and they had been at work for 3 weeks trying to get it out.

The most violent efforts made by the crew were necessary in traversing the ice at the foot of Johnson's Grade. This ice covered with deep snow was crossed in a series of jumps. Men would work rapidly cracking up the surface with picks the driver would throw in the clutch and jump the truck ahead. As soon as it hit the smooth ice progress was all off until the rougheners got busy again.

Out of their experience in this snow the party concluded that the truck would buck snow at any ordinary depth on the level. Going up a steep grade it is different. Time after time the truck would slide backwards with its wheels revolving forwards. It was simply a case of go at it again and again and here of course the shovels were brought into play particularly where the snow was drifted deep on the inner side.

After fighting their way in the trip out would have been a holiday had the crew been less tired. The turn-about and dash home was made without an instant's delay, to get full advantage of the broken road and this return trip was really as important a feature of the demonstration of the accessibility of Bear Valley as a winter resort as the trip going in. C. H. Smith says: "The truck had a terrible fight to get through on account of the snow being deeper than ordinary. We were constantly being en-

(*Continued on page* 32)



AFTER FIGHTING THEIR WAY IN, THE TRIP OUT WOULD HAVE BEEN A HOLIDAY HAD THE CREW BEEN LESS TIRED

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Maryland Applying Trucks to Interurban Work

Many Inter-city freight and bus lines

Baltimore the Center of Big Activity in Motor Transport

By Raymond Allen

BALTIMORE is fast becoming one of the great motor truck centers of the country, and certainly the greatest in the South. There is scarcely a successful business house or industry in the city without its motor delivery vehicles and big trucks, while the number of bus lines in the city which carry both passengers and express are legion. These run hither and yon, serving not only the nearby towns, but many at a distance of 20, 30 and even 50 miles. "Baltimore," some one has remarked, "is motor bus and motor truck mad," but it is a form of madness that has proven profitable to the owners of bus lines and to the commercial houses now operating big trucks in connection with their delivery departments. Baltimore is going right along buying motor trucks and passenger buses albeit that Mr. Bruce W. Duer, Transportation Expert of the Public Service Commission, has declared that jitney buses are not so numerous in the city as formerly.



Cover and inside schedule of McMahon Bros. bus line, with a map of its line and connections

WEEK-DAY SCHEDULE

NORTH BOUND

LEAVE	A. M.	A. M.	A. M.	P. M.	P. M.	P. M.	P. M.
Leave OVERLEA	7.30	9.30	11.30	3.00	4.00	5.00	6.30
Arrive KINGSVILLE	8.00	10.00	12.00	3.30	4.30	5.30	7.00
Arrive BELAIR	8.25	10.25	12.25	3.55	4.55	5.55	7.25

SOUTH BOUND

Leave BELAIR	7.30	8.15	9.30	11.30	3.00	4.30	6.30
Arrive KINGSVILLE	7.55	8.40	9.55	11.55	3.25	4.55	6.55
Arrive OVERLEA	8.25	9.10	10.25	12.25	3.55	5.25	7.25

SUNDAY SCHEDULE

BUS WILL LEAVE BOTH BELAIR AND OVERLEA AT

A. M.	A. M.	A. M.	P. M.	P. M.	P. M.	P. M.	P. M.
8.00	9.30	11.00	1.00	3.00	4.30	6.00	8.00

DARLINGTON SCHEDULE

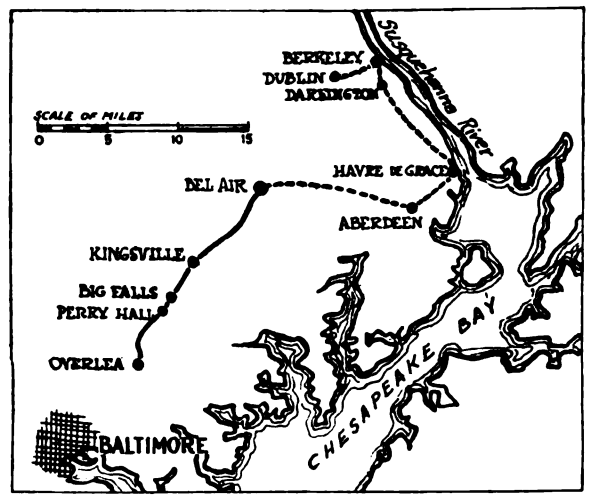
Bus will leave Darlington for Overlea daily, except Sunday, at 7.15 A. M.
Leave Overlea for Darlington at 4.00 P. M.

SPECIAL

Midnight Bus leaves OVERLEA FOR BELAIR on Saturdays only.

CARS STOP ON SIGNAL at any point between Towns to receive or discharge passengers.

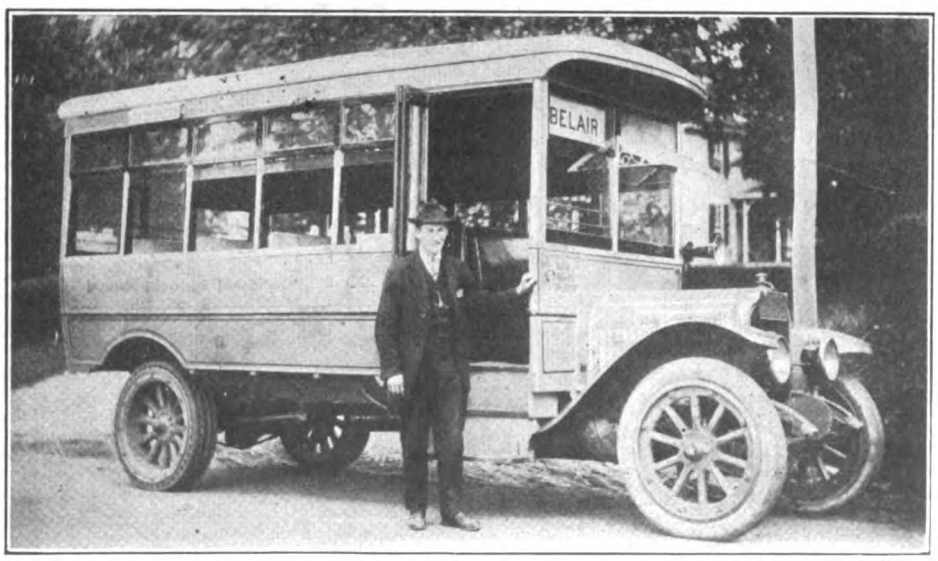
Special Arrangements Can Be Made For Parties, Etc.



Freight Lines Abound

Mr. Duer, of course, is in position to know whereof he speaks, but there are more motor truck lines registered with Mr. Duer in Baltimore than in any two cities of the South, along with a number of motor bus lines that are paying handsomely. The trade is a unit in declaring that the sales of the different types of motor trucks and accessories not only have been phenomenal but are increasing every day, fully 80 per cent of the sales having been made in the city proper.

The reason for this demand may be easily explained. In the first place those who are unable to own private cars, recognizing the splendid service the bus lines are rendering, are interesting those of larger means in forming new companies for the transportation of passengers and freight on routes without such service, and as the ventures have nearly all met with an unexpected measure of success many are glad to enter into it. Another reason for the demand is that the commercial houses of the city are taking to delivery trucks like a country girl to an ice cream cone in hot weather.



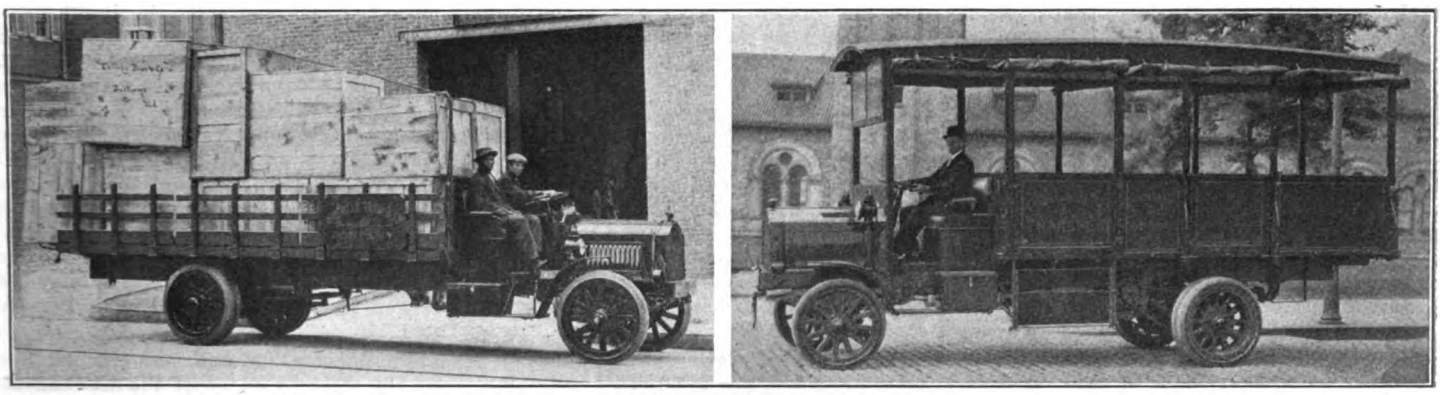
White bus used by the McMahon Bros. Transportation Co. on the route mapped above

Some Important Fleets

Being able to make prompt deliveries which, of course, means an increase in business, many trucks have paid for themselves several times over. The big wholesale houses of Baltimore can now serve the city and suburban trade almost at a moment's notice, the service being both dependable and satisfactory. The delivery truck is a big wheel in Baltimore's big business, the latter owing much of its bigness to the service of the truck. Merchants, both wholesale and retail, are buying them because the trade demands quick service.

Corkran, Hill & Co., the well known meat packers of Baltimore, have four

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Two Packards which do long-distance country and interurban haulage on contract out of Baltimore

3-tonners and one 2-tonner. This firm very readily admits that a business of any proportions cannot be successfully conducted in the old way—with the horse-drawn dray and uncertain freight train. To keep abreast of the times and abreast of one's competitor one must compete. And to compete successfully requires nothing slower in speed than trucks. Corkran, Hill & Co. have had their 2-ton truck in constant use 7 years.

Another Baltimore concern that makes use of heavy delivery trucks is the Lafayette Mill & Lumber Co. This firm has three trucks on the run every working hour of the day delivering its products. The trucks are of 5, 4 and 2 tons capacity respectively. They go to all sections of the city and far out into the counties. C. Hoffberger & Co., the well known coal and wood dealers, also use trucks, having two 2-tonners in which they make their city and suburban deliveries. F. Flanigan & Son, the paving contractors on Harford Road and Baltimore and Ohio Railroad, have three big trucks, two of which are 6 tons and one 1 ton. These trucks take the material, tools and workmen wherever the firm has a contract.

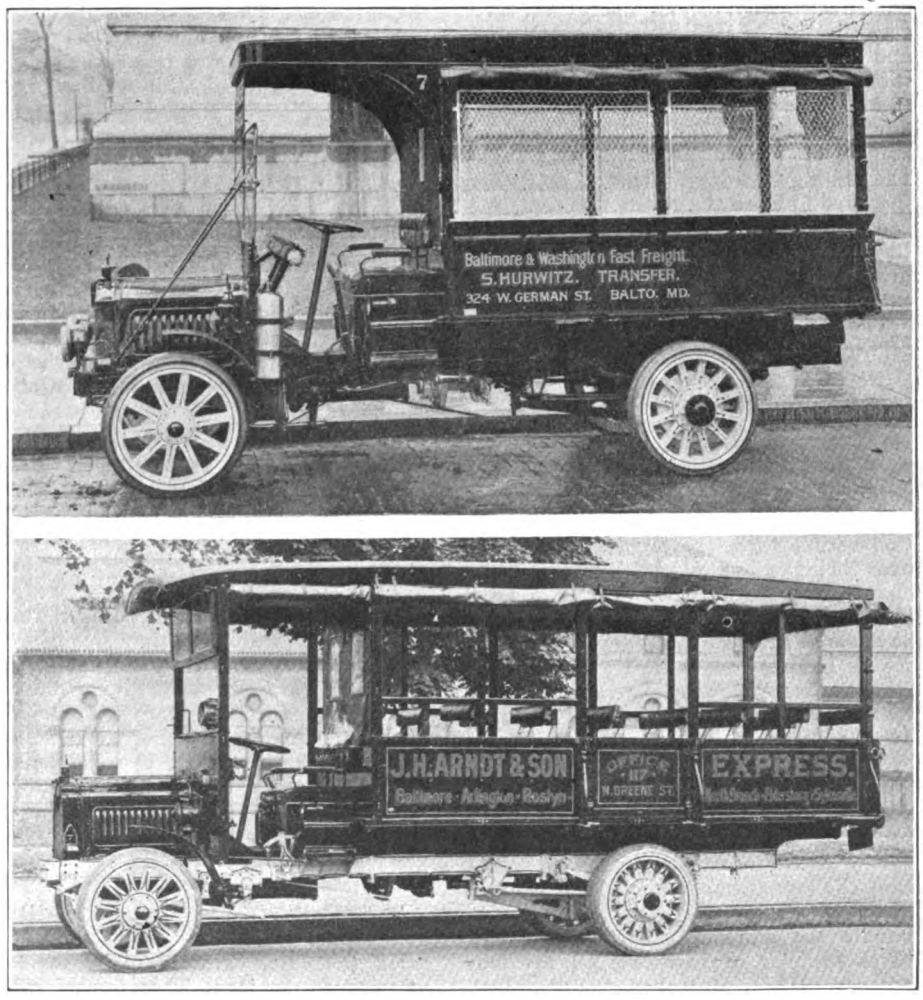
The Sparrows Point Store Co., located at Sparrows Point, in Baltimore County, a suburban town which bids fair to become famous through the efforts of Charles M. Schwab, has two 2-ton trucks which are paying for themselves and making money for the company. Likewise the Monumental Storage Co., on Park Avenue, Baltimore, of which Lawrence A. Naylor is manager, has two, one a 3-ton and the other a 2-ton. The City Dairy, which has branches in different sections of the city, finds it impossible to conduct its business with less than eight trucks, 4 of which are 3-tonners 6 years old, one a 6-ton and three 1½ tons. The tank truck and delivery vehicle of Sherwood Bros., dealers in oils and greases, are also important, 3- and 4-ton trucks.

In the Brewing Industry

The American Brewery, with its three 3-ton trucks—two of which are six and one seven years old—delivers its product to all parts of the city on schedule time that no one may go athirst, while the Crown Cork and Seal Co., with its fleet of three heavy 5-ton vehicles attends to the needs of the city trade and that of the nearby counties. The Security Storage & Trust Co. and Graham's Storage Warehouse Co., both of which are engaged in the storage of furniture and the packing, shipping and moving of same, have motor vans that are peculiarly adapted to this class of work. For this and many other reasons both concerns are liberally patronized. Not only have they a large clientele in the city but they do a great deal of hauling and moving to distant parts of the state. The former concern has two 3-ton vans and the latter a 3-ton and a 2-ton.

The Baltimore & Washington Fast Freight Transfer, of which S. Hurwitz is the owner, does a thriving business as a freight and express line between Baltimore and Washington. All the important towns, as well as the smaller ones between these cities, are served by this line, which follows the Baltimore & Ohio Railroad. Two daily trips are made from each terminus. Catonsville, Halethorp, Elkridge, Laurel and Hyattsville are getting splendid service from these trucks, and at the same time Mr. Hurwitz is making money in the freight transportation business, his rates being reasonable and delivery prompt. He operates four trucks—two 3-tonners, one 2-tonner and one 1-tonner. His office is at 324 West German Street, Baltimore.

J. H. Arndt & Son also conduct a



Trucks which run on regular schedules out of Baltimore, the one above to Washington, D. C., and the one below to towns closer by. Note removable seats in lower truck

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freight and express business that is yielding handsome profits. It is known as Arndt's Transfer and Express, with offices at 111 north Greene Street, Baltimore. He has three 3-ton trucks, two of which serve a suburban route, and the other, an open truck, is used in the haulage of grain and straw. The distance from Baltimore to the farthest town served is a trifle over 30 miles. The trucks come and go taxed to their utmost capacity with mixed merchandise, making a half trip each day. It cannot be said that this concern has fixed rates on merchandise, the charges depending entirely upon the quantity and distance freight is to be conveyed. However, Arndt's Transfer and Express is successful and a permanent fixture in transportation circles. It, too, is competing with the Baltimore & Ohio Railroad.

A Successful Bus Line

The McMahon Bros. Transportation Co., operating passenger buses between Overlea and Belair, is scarcely 2 years old, yet it is one of the liveliest, as well as soundest, concerns of its kind doing business in Maryland today. It serves the public well and the public looks upon it as its benefactor, as evidenced by the whole-hearted support which it gives.

On April 10, 1915, three brothers, Harry, John and George McMahon, president, general manager and treasurer, and secretary, respectively, of the above named company, began operating their now popular bus lines between Overlea and Belair. Viewed from a business standpoint, the possibilities, for a pessenger bus line in that section were all that might be desired. The McMahon brothers studied the proposition from every angle. The trio figured day and night, and when they had finished the result was that they had figured themselves into the McMahon Bros. Transportation Co. They are figuring to-day, and happily on the profit side of the ledger.

The company operates five buses, four of which are eighteen-passenger and the other a ten-passenger. These buses are fully equipped with electric lights and automatic heaters, making them comfortable in every particular. They also are equipped with the convenient pay-as-you-enter device, requiring but one man to a bus. The bodies are of the Brill Semi-Convertible type, the eighteen-passenger ones being mounted on 1½-ton White chassis and the ten-passenger on a Ford chassis. To make these buses attractive no expense has been spared, new improvements having been added from time to time that they might take rank with the most thoroughly up-to-date buses operating anywhere in the South.

May Need More Buses

Passenger traffic on this line has been heavy all winter, and with the advent of spring it has increased to such an extent that the management may deem it expedient to purchase one or more buses to handle the summer traffic, which now gives promise of breaking all previous records. Harry McMahon, the president, states that while has has no record of the number of passengers carried weekly during the winter months, the buses have been taxed to their utmost capacity on every run. Running under the winter and spring schedules, seven round trips daily are made between Overlea and Belair, with eight on Sunday. Sunday travel is some heavier than on week-day trips. During the summer months more frequent trips are made. The signs and portents for the coming summer would indicate that the buses, with one or two extra ones, will be worked overtime if a patronizing public is to have the service which it demands.

The rate of fare one way between Overlea and Belair is 50 cents, no reduction being made for a round trip. The distance is 16.6 miles. The region traversed is very populous, being dotted here and there with manufacturing establishments of every known kind. It is said that somewhere in the neighborhood of 20,000 people are served, though, of course, all do not live directly on the route.

The company does a profitable package business, for which it charges according to weight and distance. Notwithstanding the fact that the McMahon line competes with the Baltimore & Ohio Railroad and any number of private bus lines, it is forging right ahead and will continue to do so now that it has taken the public into its confidence. "This company is here to stay," said one of the management, "our one great aim being to cater to the public. There is no mistaking the public," he continued. "It knows what it wants, and it is for us to see that it gets it. So long as we do this we have nothing to fear."

Connects With Another Line

The points served by this aggressive concern, starting out from Overlea, are Putty Hill, Joppa Road, Perry Hall, Big Falls, Kingsville, Little Falls, Lynch's Corner, Gittings, Lee's and Belair. At Belair the buses connect with another line for Aberdeen, Havre de Grace, Dublin, Darlington and Berkeley. The run from Overlea to Belair is made in about one hour.

The main office of the McMahon Bros. Transportation Co. is located at Mount Washington, in Baltimore county, where the brothers are engaged in business entirely apart from that of transportation.

General Hauling Contractor

There are two concerns doing a thriving freight transportation business in Baltimore City and Anne Arundel, Baltimore and Harford counties, known as the Odell Transfer Co. and the Briddell Transfer Co., and while they neither serve regular routes nor operate under a regular schedule they are none the less in demand as freight carriers. The city and adjoining counties are their field. They operate daily, usually with loads in both directions.

The Odell Transfer Co. and the Briddell Transfer Co. gave no thought to a tariff schedule. They haul by the load at so much per load. They figure on distance, of course, which is about the easiest of the many features connected with the transportation business. The Odell concern is now operating six trucks—three 3-ton, two 4-ton and one 2-ton—the 2- and 4-tonners having seen five years' faithful service. The Briddell Company also operates six trucks, one of which is a 3-ton, one a 2-ton and four 1-ton, the twelve trucks of the two companies being mounted on Packard chassis. The construction of the bodies is such that bulky freight may be loaded and unloaded quite conveniently and easily. The larger trucks are manned by a crew of two.

That motor bus and motor truck lines on the western shore of the Chesapeake Bay are growing more and more in demand every day is not only the sincere conviction of those operating such lines but a very palpable fact, and it is not too much to say that the eastern shore, or Maryland Peninsula, is woefully behind in the field of motor transportation, due to the fact that few capitalists of that section have the temerity to finance anything of the sort. The people are calling for it and would patronize liberally an interurban freight line.

The Passing of an Impassable Pass

(*Continued from page* 29)

veloped in snow flurries while fighting our way in. The snow was so thick that the pictures we took were spoiled. Between snow squalls the sun would come out. We were alternately hot and frozen and soaked, but once the truck had bucked the snow and made tracks down to a solid bottom it would be easy for a car. A whole procession could have gone in after us and not had a bit of trouble. All it needs is one good fighting crew and a powerful truck to go through after every storm."

The object of this trip was to find out if Bear Valley was accessible enough for development as a winter resort. We have found it is, but the trip proved something of even greater national interest. Bear Valley lies at about the same height in the mountains as a number of the most important mountain passes which are closed to east- and west-bound travel through at least 3 months of the winter. In military circles this has always been considered the great weakness of the country, as with the blowing up of a few railway routes it would mean the isolation and consequent loss to the nation of the strip of the Pacific Coast with its tremendous wealth in agricultural products, mineral and timber. Soldiers from the East could not come to its defense until an enemy would have time not only to capture but to fortify this region which with all its wealth still has a population inadequate for its defense against a trained army fully equipped landing in large force.

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Boston Truck Exhibitors Vote Show the Best Ever

Many Prospects Secured and Show Sales Made—Favor Combined Exhibitions

BOSTON, Mass., March 10—Practically all exhibitors of motor trucks in the commercial vehicle division of the Boston show which closed here tonight agree that it was the best show ever held in the city. This agreement is based on the large number of good prospects secured and the sales consummated during the show week.

All except a few of the dealers of the thirty-nine makes of trucks which were exhibited secured a larger number of prospects than ever before, even in the days of the last exclusive truck show held in 1914. Several dealers or agents made bona fide sales to merchants who had not been approached before and many other purchases previously considered were consummated at the show.

Combined Show Favored

Other highlights of the truck exhibition as gleaned from the exhibitors by a representative of this magaine who interviewed them just before the close of the show on Saturday night are that a combined passenger car and truck show is preferable to an exclusive truck show and that it might better be held a week earlier than usual in order that truck purchases made at the show can be delivered in time for the opening of the season on or about April 1.

In many cases trucks on which special bodies are required cannot be delivered before 2 months, or about May 1. This late date of delivery often upsets the plans of the purchaser to a considerable extent, especially those who wait for the show before deciding on what particular truck they wish to buy. This condition has been further aggravated by the traffic congestion on practically all of the eastern railroads. Even when shipped by express many trucks were held up en route due to one or more of the many embargoes which the railroads have instituted at a moment's notice for 1 or more days or even a week at a time.

Freight Congestion Will Continue

Many concerns in New England are of the opinion that the present freight congestion along the Atlantic seaboard is liable to continue for several years, even should hostilities cease abroad and the maritime trade of the world be resumed to a fuller extent. This opinion is also held by many of the truck makers throughout the country and was brought out very forcibly by L. J. Ollier, vice-president and director of sales for the Studebaker Corp., Detroit, at the New England Studebaker dealers' dinner held during the Boston show week. The reasons put forth for such a belief are that the railroads are not keeping pace with the business and industrial development of the nation and that freight congestion will continue until such time as they put a greater rolling stock into service and even perhaps increase the main trackage in addition to improving the freight terminal facilities.

Some Exhibits Shipped Overland

Under these conditions many of the dealers are planning to have their trucks shipped overland when the country roads are passable. While a great deal remains to be done before overland delivery will become a service that can be relied upon for every day of the year irrespective of weather and road conditions, several of the Boston dealers received by overland routes the trucks they exhibited in the show.

Among these was a 6-ton Gramm-Bernstein which made the complete trip from New York City to Boston in 18 hr. 45 min. This time, which included stops of 3 hr. 45 min., giving an actual running time of 15 hr. for the 254 miles, was considered remarkable when it was considered that the vehicle ran through a snow storm and covered many roads deep in snow.

Brockway Ships Overland

The Brockway Motor Truck Co., Cortland, N. Y., will also deliver its chassis overland from its plant to New England points over the State highways, and brought this forcibly to the attention of its prospective purchasers by means of a painted sign on the wall of its booth at the show. This sign gave the actual running time between the Brockway plant and five of the largest New England cities. For example, the running time between Cortland and Portland, Me., is 31 hr.; between Cortland and Boston, 25 hr. and New Haven, Conn., 23 hr.

The Brockway sign and the Mack and G. M. C. exhibits, the latter two explained and illustrated on pages 17 and 18 of this issue, were the three best examples of better truck merchandising seen at the show. Both of the unusual truck exhibits just mentioned resulted in obtaining a larger number of prospective purchasers than ever before. In fact a crowd several deep was always in front of the Mack truck laid on its side with the lower halves of the motor, gearset and jackshaft removed to show the operation of the propelling means.

While many of these were pure sightseers who learned for the first time just how the power of the engine of a motor truck is transferred to the rear wheels to make the vehicle run, the chief engineer of one of the most prominent makes of trucks was seen standing before the railing inclosing the exhibit for almost an hour, making notes and sketches of the various details of design.

Norman Halliday, manager of the Mack Motor Truck Co., which exhibited the truck laid on its side, obtained more than 150 prospects, almost double those of last year. This large increase he attributed chiefly to the novelty of the exhibit and the great amount of interest which it excited. He also made a bona fide show sale of one of the smaller models of Mack trucks and besides closed two sales with merchants who waited until the show before making their decisions.

Show Justified Expense

Practically every dealer who exhibited averred that the show justified its expense, irrespective of the number of prospects obtained or the number of sales consummated. The advertising value of the show and the ability to keep each of the various truck makes before the public eye from year to year are considered great assets by the salesmen when they get out into the field after the show.

Several of the dealers were of the opinion that the show held off prospective purchasers from buying until they could look over the entire offering before making their decisions. Among these was the Autocar branch, which sold more trucks during the week preceding the show than during the week of the show itself. Similarly the manager of the Stewart Automobile Corp., which handles the Stewart line, was of the opinion that the show made some prospective purchasers hold off buying. Sometimes these buyers decide on other makes of trucks than those originally thought of, but these changes of mind generally average up fairly well so that they figure only slightly in the total sales made by any one concern during the year.

Manager Prime of the Packard truck department was one of those in favor of a separate truck show because of the basement location of the trucks and his belief that fully 90 per cent of the attendance in the basement consisted of those who came to the show solely to see the various passenger car models and just drifted down into the basement to see the trucks in order to get their money's worth out of the price of admission. Notwithstanding these sentiments, the men in the Packard both obtained from five to ten live truck prospects a day and closed orders for fifteen trucks. Last year only three trucks were sold at the show, and in 1915 none at all, so that from the Packard standpoint the 1917 exhibition was considered the best truck show ever held.

Few Favor Exclusive Show

Similarly Day Baker, who handles the Hurlburt line, was in favor of a separate truck show, as was also E. G. Moulton of the New England Truck Co., Fitchburg, Mass., E. F. Twyman, Jr., R. E. Taylor Corp., agent for Gramm-Bernstein trucks, and M. E. Brackett, manager of the Boston G. M. C. branch.

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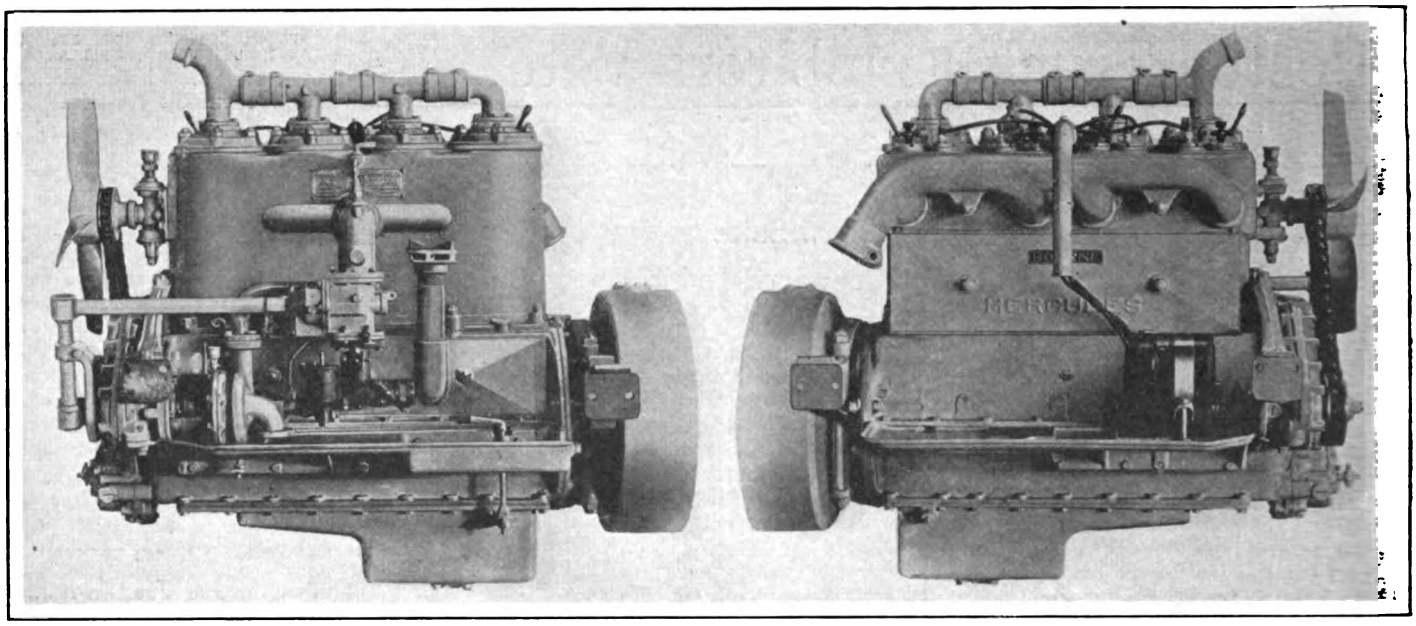


Fig. 1—Two sides of the heavy-type Hercules engine. Note in the left view the inlet manifold and crankcase plate and in the right view the unobstructed valve-spring inclosure

Heavy-duty Hercules Engines for Motor Trucks

Full Pressure Oiling, Five-bearing Crankshafts, Individual Separate Heads and Unusual Supporting Means Used

SOLELY intended for industrial vehicles, such as trucks, tractors, road rollers, etc., Hercules engines are now being supplied by the Hercules Motor Mfg. Co., Canton, O. A full range of powers for these applications is covered by two types of construction, a light series C and a heavy series M, both being alike in all essentials and intended for slow-speed heavy-duty service. There are eight different sizes, ranging from 19.61 N. A. C. C. hp. to 32.40, as follows:

Model	Bore	Stroke	Piston Displacement	N.A.C.C. Horsepower
C	3½	5⅛	197.23	19.61
C-1	3⅝	5⅛	211.58	21.08
C-2	3¾	5⅛	226.42	22.50
C-3	4	5⅛	257.61	25.60
M	4	5½	276.45	25.60
M-1	4⅛	5½	294.00	27.20
M-2	4¼	5½	312.09	29.00
M-3	4½	5½	349.90	32.40

In general, these engines are of L-head block-cast four-cylinder design with inclosed flywheels, adapted either to unit power plant or separate mounting. They are designed for direct application to chassis frame side-members and are supported on three points. A feature of unusual nature are their detachable cylinder heads which, contrary to the usual practice of casting them together and gasketing the single head to the cylinder block, are separate circular castings, bolted separately to a common cylinder block and having small individual circular gaskets.

Five-bearing Crankshaft

To fulfill their heavy-duty mission, they have been given five-bearing hollow crankshafts. To safeguard lubrication under the trying conditions certain to be met, full pressure oiling has been resorted to, by means of drilled crankshaft and even copper oil tubes on the connecting rods. Effective cooling is aspired to and so the cylinder jackets have been extended clear down to the base of the cylinder block, with the entire cylinder head filled with water as well.

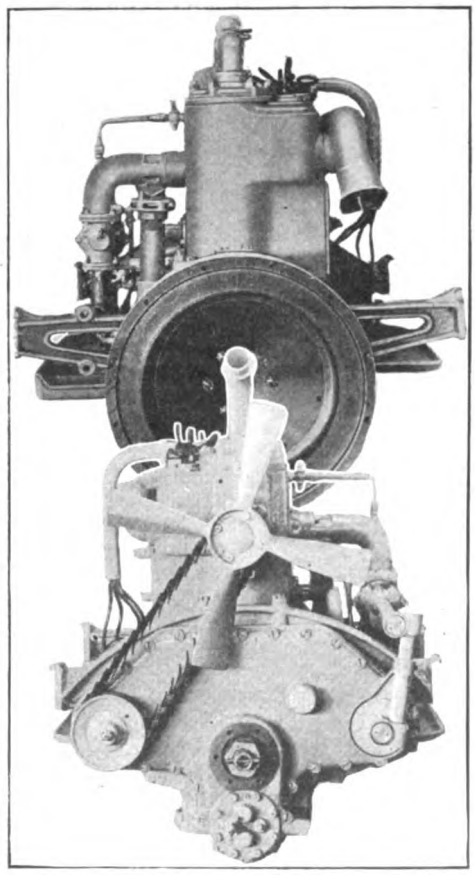


Fig. 2—Back and front of the heavy Hercules. Note deep water-jackets and side webs in the upper view and the neat timing gear-case and pump location in the lower one

Accessibility has been insured by the cylinder head design, for one thing, by the grouping of both accessories and manifolds so that there can be no interference with access to the valves, and furthermore by applying a large crankcase plate to the side, which, when removed, permits one to take up the crankshaft and connecting rod bearings or to disconnect the latter for removal of the pistons and rods through the cylinder heads. Of course the crankcase is transversely split with a separable oil reservoir at the bottom. The oil pump has been placed at the front end of the motor where it, too, is highly get-at-able.

Pre-heated Charge

Economy of fuel is cared for by the casting of the inlet manifold in the cylinder block, with a simple pipe connection on the non-valve side for the governor and carbureter. This warms the incoming gas, permitting vaporization of those fuels of low volatility which we may expect in future.

The cylinders are cast of 20 per cent semi-steel, with the crankcase either of aluminum alloy or cast iron, as desired. There are cast webs at the sides of the upper half of the crankcase unless the purchaser does not wish them, which meet the frame, thus eliminating the underpan, serving as a base for accessories and a convenient tool rest when working on the engine.

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Hercules

Instead of having integral support arms cast on the flywheel bell-housing, this member is made of thin, light section and a malleable iron cross-yoke is used to support the rear end. The usual drop-forged, heat-treated front cross-member is employed, except that a departure from the usual practice in three-point suspension has been made in having the two-point support on the front member and the flexible one-point mounting at the rear. This is accomplished in the rear by having the rear member a complete yoke, surrounding the narrow hub of the flywheel bell-housing just where it joins the crankcase, these being a dry fit, so that warpage of the frame will not stress the engine through the rear support arms.

In the cylinder-head design, two advantages accrue as already pointed out; but in addition to these another desirable feature is attained, namely, the true dome cylinder head shape is closely approximated. That this is possible with the L-head design of cylinder is due to reduction of the valve pocket to its minimum size and by slightly doming the piston head, giving greater permissible depth to the dome in the head.

Hollow Crankshaft

The mechanical system of the engine, comprising the crankshaft, flywheel, timing gears, camshaft, pump and magneto shaft, and valve action are conventional save for the hollow crankshaft. Each lengthwise portion of the shaft is drilled out to a diameter of ¾ inch. The crank cheeks are also drilled and the exterior openings plugged. The flywheel, which may be made in special form to suit individual requirements, is bolted to the crankshaft flange by six bolts. The starter gear-ring is a separate piece of high-carbon steel, drop forged and heat-treated instead of being merely milled into the soft periphery of the semi-steel wheel.

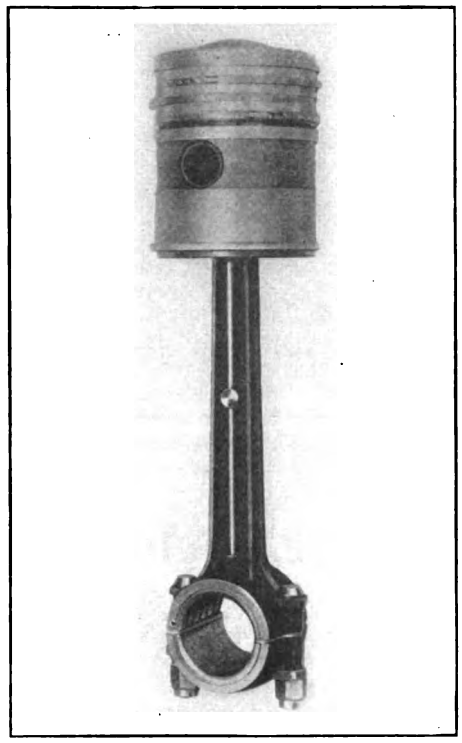


Fig. 3—Hercules piston and connecting-rod assembly. The piston has five rings and a domed top. Note oil tube on rod

The camshaft is of the one-piece type, running on three bearings the two front ones of which are of sufficient diameter to allow the shaft to be withdrawn endwise. Valve lifters are of the mushroom type, all interchangeable, as are the tungsten-steel valves. The tappets and springs are carried in a conventional pocket on the right side of the engine, covered by a single pressed-steel cover-plate in the M-series engines and by two in the smaller ones.

Brass-backed Fahrig-metal main bearings are employed, white-metal bearings being used for the camshaft. The timing gears are of the helical type, drop forged of high-carbon steel. Shims for the main bearings are of the laminated type, so that in adjusting them it is not necessary to file the shims down, but merely to peel off one or more of the thin laminations.

Pistons are made of the same semi-steel of which the cylinders are cast and each carries five Leak-proof rings, the fifth an oil scraper on the skirt. Connecting rods are 40 per cent carbon steel drop-forgings, heat-treated. Two bolts are used at the crank end. Wristpins are of low-carbon seamless-steel tubing, case hardened and ground. The pin is held fast in the piston bosses, and bears in a Non-Gran bronze bearing held by the connecting rod.

Full Pressure Lubrication

Lubrication, being on the pressure plan, depends primarily upon the pump. This is located at the front of the engine, in the timing gearcase, and just below the crankshaft. This pump is of the gear type, drawing oil from the reservoir and forcing it through copper tubes cast within the upper crankcase half, these tubes running longitudinally and serving as oil manifolds for the entire engine.

Each web holding a main bearing is drilled to receive the oil from the longitudinal pipe and to conduct it to the inside of the bearing. At each bearing

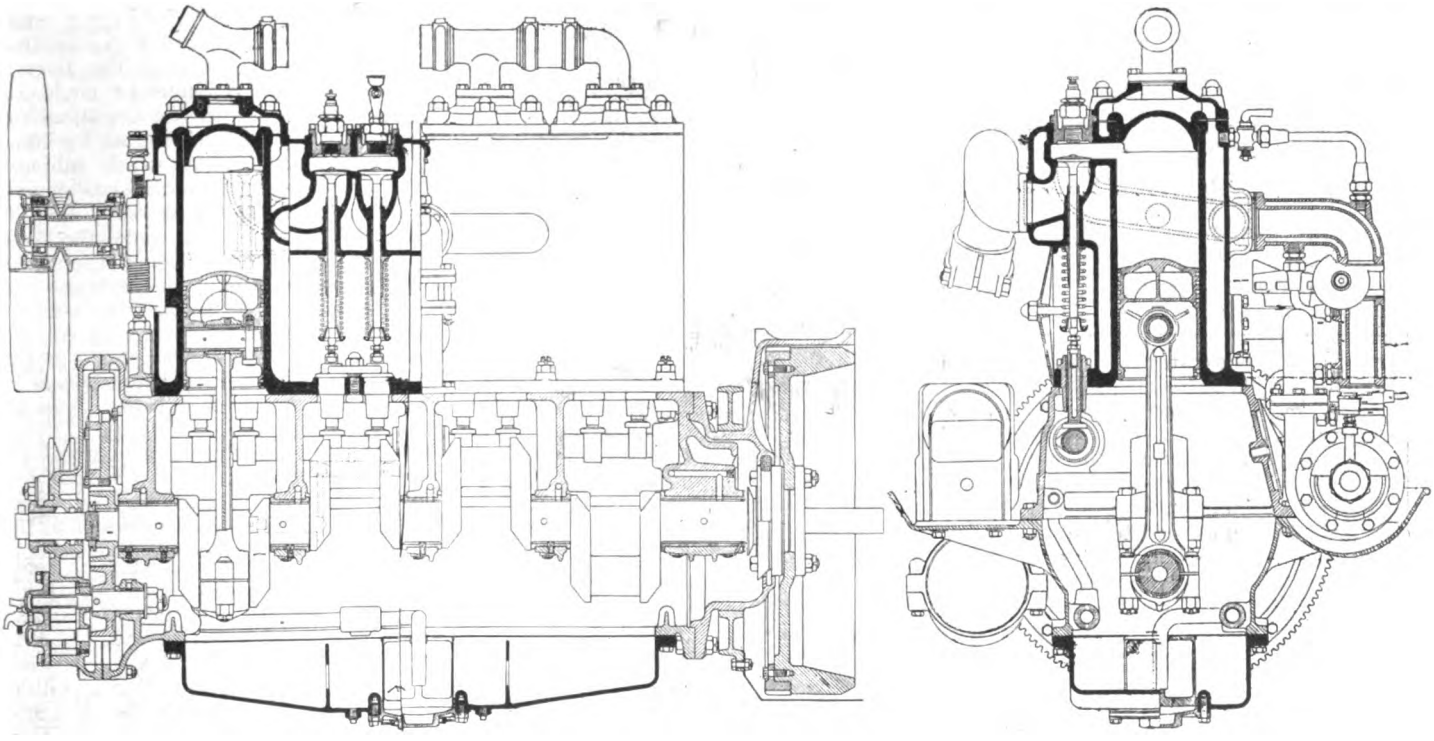


Fig. 4—Sections of the Hercules truck engine, showing clearly the cylinder head construction, small valve pockets, hollow crankshaft and lubrication scheme. Particular attention is directed to the deep water spaces, the robust fan hub and the free rear support yoke about the neck of the flywheel bell-housing

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there is an opening in the shaft communicating with its drilled-out interior. This serves to conduct surplus oil from the bearing to the connecting-rod bearings. Similar connections are made between the crank-pins and drill-ways in the connecting rods, the oil being conducted up to the wristpins by copper tubes carried by the rods. A separate lead conducts a stream of oil over the timing gears. The spray sent off by the connecting rods serves to lubricate the camshaft, lifters and cylinders.

Adapted to High Carbureter

Surplus oil drains through the crankcase to the reservoir below, where it settles into a well at about the middle. This well is supplied with fine screens through which the oil is strained before being drawn again to the pump. The pump is low enough to always be supplied with oil.

Inlet and exhaust headers are on opposite sides in order not to overcrowd one side with fittings. The inlet header is simply a direct pipe, bolted to the cylinder block. It is water-jacketed so that if it is desired to have a long pipe in order to get the carbureter low enough for gravity fuel feed, manifold condensation may be avoided. It is made in two parts, however, so that the higher carbureter position which is desirable and possible with vacuum or pressure fuel feed may be secured.

The exhaust manifold is on the valve side of the engine, but is carried high enough to clear the valve-spring inclosure plate entirely.

The engine is intended to be governed by one of the manifold types of governors, driving accommodations being provided off the end of the camshaft for either rigid or flexible shaft drives. Any standard type of magneto may be applied and any conventional electric starting and lighting system.

Forced Water Circulation

Cooling is secured by centrifugal pump circulation, the pump being driven by a separate gear in the heavy models and by the same shaft that drives the magneto in the lighter ones. The water intake is at the bottom of the cylinder block and at its middle, from which a straight symphonic rise leads it to the openings into the separate heads.

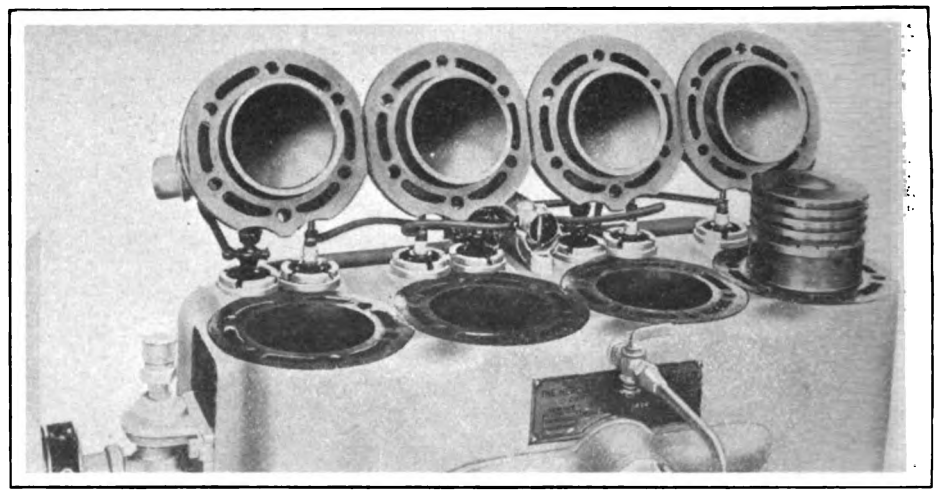


Fig. 5—Hercules cylinder block with heads removed, showing free water passages, deep flanges and manner of removing pistons and rods through heads

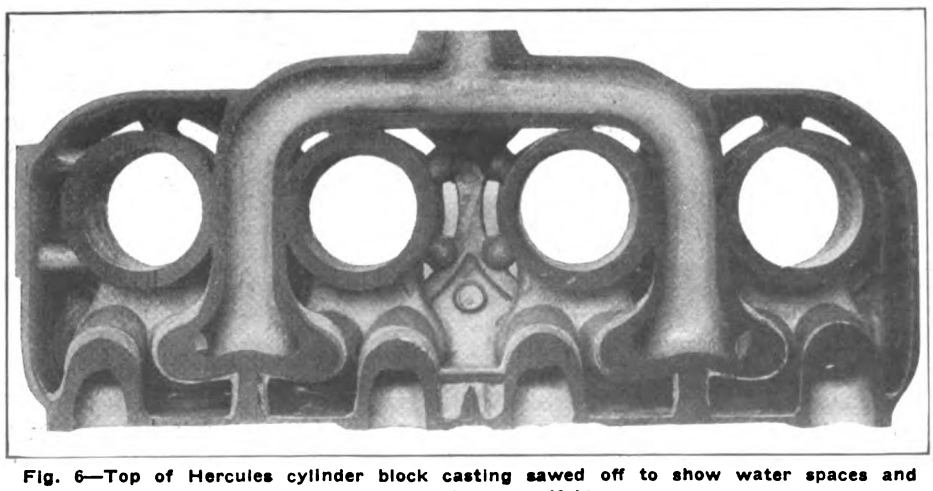


Fig. 6—Top of Hercules cylinder block casting sawed off to show water spaces and cored-out inlet manifold

Users' Club Needed in New England

Get-together Would Be Beneficial

BOSTON, Mass., March 10—Great benefits would accrue to the large number of commercial vehicle users in New England were they to form an organization by means of which they could get together and discuss the various methods of economical truck operation. At the present time there is no such organization in the entire New England territory in which there were approximately 32,000 motor trucks in operation at the beginning of 1917.

While it might not be possible to form one organization which could serve the owners of this large number of trucks, it would be entirely feasible to establish owners' organizations in various of the cities such as Boston, Springfield, Providence and perhaps New Haven or Bridgeport.

Boston, with its 5000 or 6000 vehicles registered in the city and immediate suburbs, would be the logical place in which to first form such an organization. While the primary objects of such an association would be to benefit the users of motor trucks, it is highly probable from experiences gained by similar organizations in New York City, Newark, N. J., and Philadelphia, Pa., that the men actually in the trade selling trucks or their accessories would have to start the ball rolling. This was the case in all three of the cities just mentioned in which organizations of motor truck users are now in existence.

The Philadelphia motor truck association is still controlled entirely by the trade members, but that in New York and also the one in Newark now have their affairs directed almost exclusively by actual owners of commercial vehicles.

Benefits Which Would Accrue

With the several thousand prospective members to choose from in the Boston territory, a sufficient nucleus could be obtained to start such an organization and gradually get it on its feet by holding monthly meetings at which subjects of direct influence on the economical operation of motor trucks could be discussed. These could include the best methods of garaging and repairing motor trucks; how additional tire mileage can be obtained from trucks in various classes of service; how drivers can be made to give their best services to the truck owners, either by an increase in wages or by offers of various forms of bonus systems.

Other subjects which are of great interest to the users of trucks in the New England territory as well as those throughout the country would be the methods by means of which owners in various classes of work increased the running time of their vehicles, through the use of some particular form of loading or unloading device or by means of specially designed bodies.

The dues charged for membership in such an organization could be made nominal in order that a large number of charter members might be secured. Such nominal membership fees would carry

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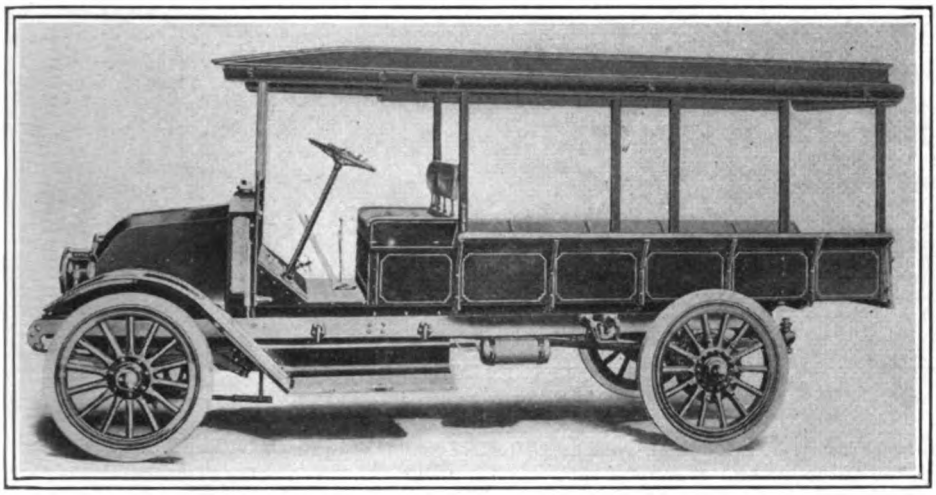


Fig. 1—The I. H. C. 1-tonner, showing French hood and dash radiator

I. H. C. Trucks in Two Capacities Have Unusual Axle of Own Make

TWO models of truck are manufactured by the International Harvester Corp., Akron, Ohio, of ¾- and 1-ton capacity, alike save in size and minor details. On both of these models, since last October, the rear axles have been manufactured by the International company.

I. H. C. SPECIFICATIONS

Capacity, lbs	1,500	2,000
Price	$1,225	$1,500
Wheelbase, in.	115	128*
Tires, front	36x3	36x3½
Tires, rear	36x3½	36x4
Bore, in.	3½	3½
Stroke, in.	5¼	5¼
N. A. C. C. hp.	19.61	19.61
Speed, r. p. m.	1,275	1,300
Speed, m. p. h.	18	17
Gear-ratio in high gear	7-1	8-1
Final drive	Internal gear	

*146-inch wheelbase, $50 extra.

In both models the same engine is used. This is also an International product. It is a block-cast L-head type with the valves to the right. The engine consists of three main castings, namely, the cylinder block, the upper crankcase half which includes the timing gearcase and the four support arms by which it is supported from the four-point subframe and the lower crankcase half, acting as an oil reservoir.

This motor is carried beneath a French hood with the radiator at the dash, consequently an unusual arrangement of the cooling system is required. The water pump is located at the front of the engine, driven from the same cross-shaft which drives the magneto. The flywheel is exposed and has fan blades cast in its web. A pressed-steel fan is located back of the engine, driven by a belt off a pulley attached to the protruding rear end of the camshaft.

The radiator has a finned-tube core, mounted in a sheet-metal casing.

The carbureter is a Holly on a short pipe, bolted to the left side of the engine, the manifold being cored within the cylinder casting, so that the charge is preheated. The governor is mounted on the front end of the camshaft, connecting with the governor valve just above the carbureter through inclosed tubes, all joints being so sealed that tampering without detection is impossible.

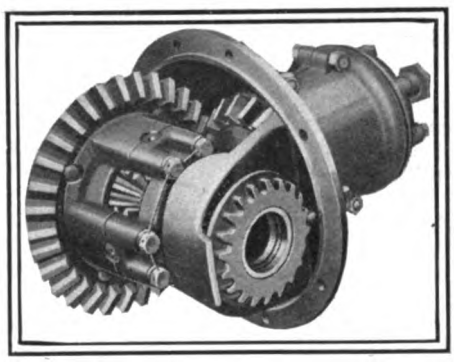


Fig. 2—The differential unit of the I. H. C. axle, demountable as a unit

The magneto is driven off the transverse shaft at the front of the motor that serves to drive the pump. The shaft is driven directly off the camshaft gear, these and the crankshaft gear being the only three gears in the engine. This drive is made possible by the fact that the teeth of the gears are helical, so that the cross-shaft gear may take its drive from the camshaft gear direct, although having a perpendicular axis.

The magneto is of the single type, with fixed advance.

Mounted in the flywheel is the leather-faced cone clutch, separated from the gearset by a short shaft with two leather disk universals. The gearest is of the three-speed selective type, driving the axle by a shaft with two universals of the block and yoke type. The shaft is splined into these universals, the shaft being tubular.

The International axle is of the internal-gear-driven type comprising a solid load-carrying axle and a live jackshaft. The dead axle is round except at the center where it spreads out in the form of a flange, to which the differential housing bolts. Unlike other American internal-gear-driven axles, this has exposed jackshafts, although this is not the only one in this class. There is no connection between the differential and the axle ends save the live jackshafts. The jackshaft member is located in front of the dead member. Both brakes are internal, side-by-side acting in the same drums.

The exposed shafts have been adopted because of the twisting which is experienced in an internal-gear-driven axle. The exposed jackshafts give the axle a certain amount of flexibility which is preferred to the rigidity that would be

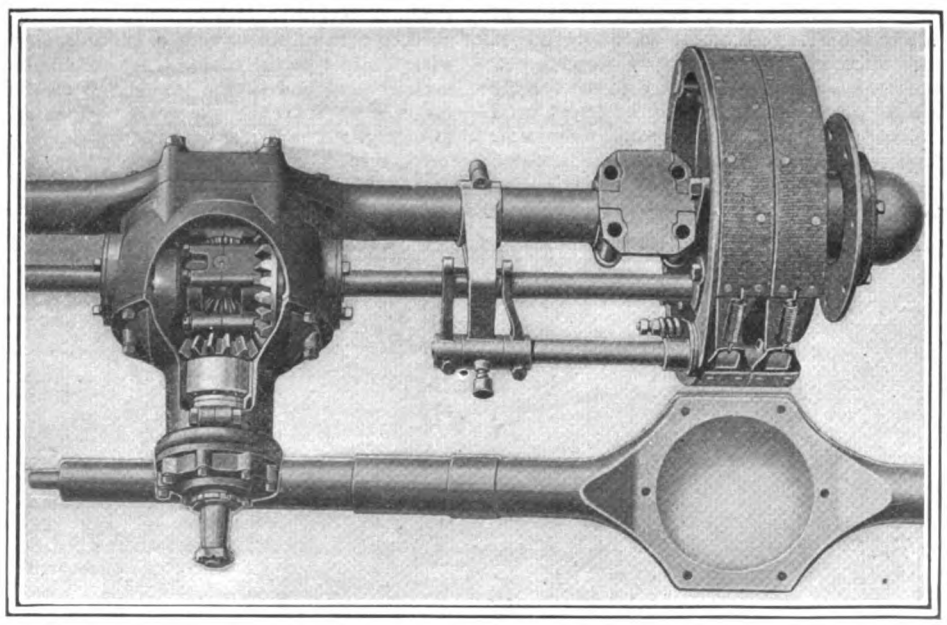
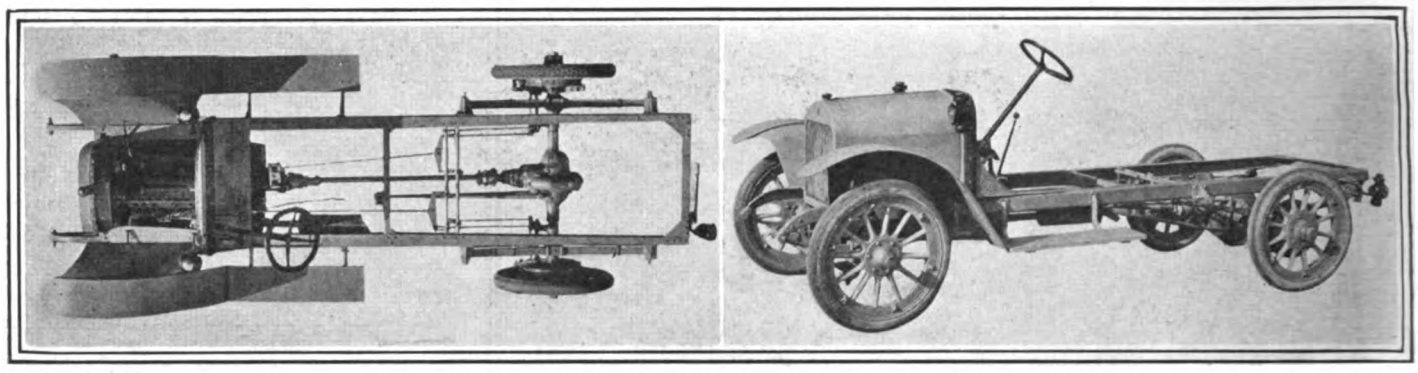


Fig. 3—The I. H. C. rear axle with differential housing cut away to show gears. Beneath the axle is shown the solid forged load-carrying member

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Overhead and side views of the Mackbilt 1-ton truck

obtained by having heavy jackshaft tubes because of the lighter weight that is possible. Glands serve to pack the shafts against leakage of oil from axle ends or differential housing and to exclude dirt.

Hotchkiss drive is employed in the International truck, the rear springs being of the three-quarter platform type.

Although solid tires are regularly applied to I. H. C.s, pneumatics will be applied if desired. Details of the new axle are shown herewith.

Mackbilt a Conventional ¾-Tonner With Refinements in Detail

MACKBILT is the name of the new 1500-lb. truck being produced by the Metropolitan Motors, Inc., New York City, after William C. Mack, the president of the concern and formerly of Mack Bros., pioneer truck builders. A single chassis of conventional design is built, having bevel drive and pneumatic tires, for fast delivery work.

MACKBILT SPECIFICATIONS

Capacity, lbs.	1,500
Price	$895
Wheelbase, in.	115
Tires, front	34x4
Tires, rear	35x4½
Bore, in.	3¾
Stroke, in.	4¼
N. A. C. C. hp.	22.50
Gear-ratio in high gear	6-1
Final drive	bevel

Appearance has not been appraised at lower than its real worth in the design of this vehicle, recognizing the importance of neat and snappy lines in a vehicle whose advertising value is as great as a delivery vehicle for the retail merchant. Toward this end, the vehicle has its hood set well back of the front axle, with easy tapering lines, a passenger-car type radiator and smooth fenders innocent of the blemish of rivet-heads.

Unit power-plant construction is employed, the engine clutch and gearset all depending upon but three points for support, these being directly on the main frame. The rear support, instead of the usual cast arms on the flywheel bell housing, are in the form of a forged arch of T section, bolted to the rear flange of the bell-housing. Both the pedals and the lever pedestal are carried by the power-plant unit.

The engine is a block-cast L-head design, with valves to the left, the cam shaft, tappets and oil pump being mounted in a separate casing bolted to the side of the crank-case. Both manifolds, the carbureter and the magneto are located on the valve side of the motor.

Thermo-syphon water circulation is used, the radiator having a cellular core with a sheet-metal casing. An extension tank is attached to the inside top of the radiator to increase the water capacity. The Rayfield carbureter is fed by gravity from a tank beneath the seat. No governor is fitted.

Ignition is secured from a Dixie high-tension magneto, with hand spark advance.

The clutch is a two-plate type running in oil, the plates being faced with asbestos-wire fabric. The gearset affords three speeds on the selective plan. Drive to the axle is by a shaft with two universals. The axle is of cast steel and is fitted with a torque arm. Propulsion is taken by the semi-elliptic rear springs.

Brakes are both on the rear wheels, the foot brake external and the hand brake internal. Beam eveners are used. A pressed-steel frame with integral front spring-horns is employed and it is flexible in type.

The steering wheel is at the left, without any levers either on the wheel or column, the throttle being controlled by an accelerator and the spark by a dash lever. This lever is mounted on a plate which also carries a carbureter air adjustment, both being plainly marked as to direction of action as shown in the illustration. The hand levers are in the center of the cab.

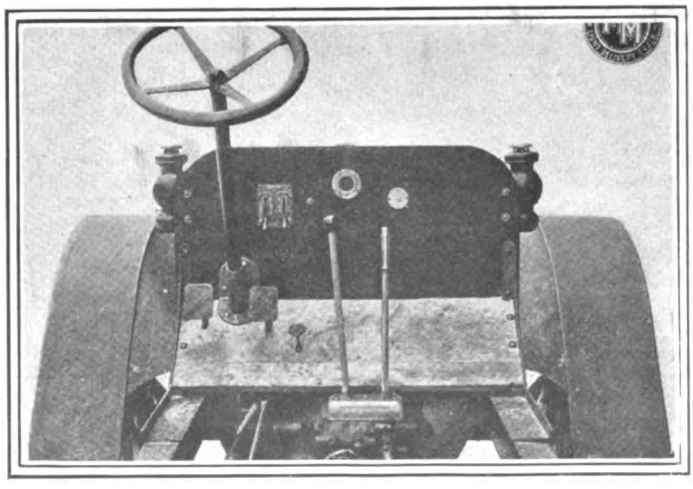


Fig. 5—Dash and controls of the Mackbilt. Note absence of levers on steering column ball-ended hand levers and dash spark and carbureter adjustments

Users' Club Needed in New England

(*Continued from page* 36)

the association along until such time as the membership increased to a large enough number that a sufficient surplus could be obtained to test out various forms of new accessories designed to reduce truck operating cost or for legal fees to protest against unfair or discriminating legislation in town, county or state.

The time is now ripe for the formation of such a motor truck users' organization in Boston. In Massachusetts the number of motor trucks increased from 11,960 to 18,194 in the year 1916 or an increase of 52 per cent. All indications point to a larger increase in the use of commercial vehicles during the coming year as is pointed out in the leading article descriptive of the Boston motor truck show in this issue. The great benefit accruing to the members of similar organizations in the states of New York, New Jersey and Pennsylvania make it certain that similar advantages could be obtained.

All that remains to be done in order to form such an association with the aims as outlined above appears to be the selection of a well-known man in the motor truck trade and one who has considerable organizing ability.

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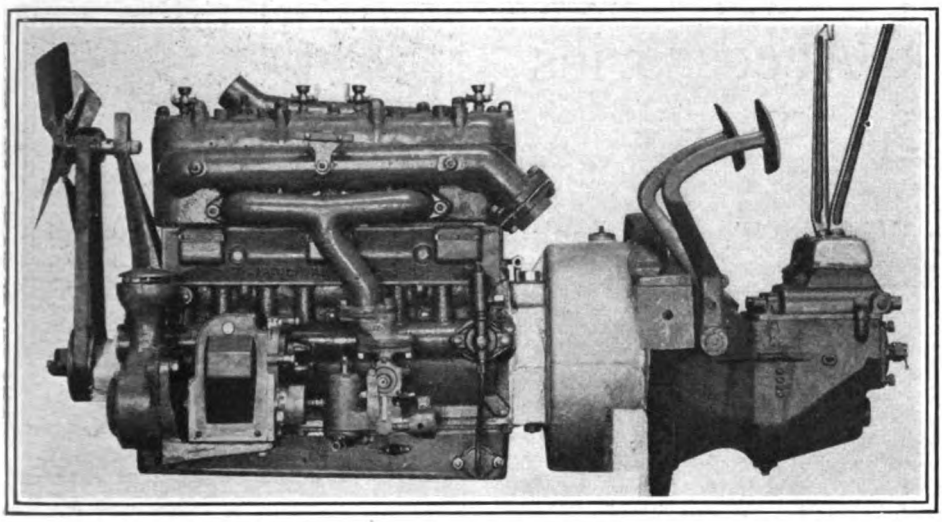


Fig. 6—Powerplant of the Mackbilt, showing separate rear support arm

Corbitt Adds ¾- and 1-Ton Vehicles

TWO new Corbitt models have been added by the Corbitt Automobile Co., Henderson, N. C., of ¾- and 1-ton capacity. These models are similar to the other models of 1½, 2, 2½ and 3½ tons capacity, and give this southern manufacturer a complete line. The Corbitt company has recently acquired additional financial strength and intends to extend its activities, previously confined to the southland, to northern fields.

Unit power plant construction, as in all previous Corbitts, excepting the 3½-tonner, is found in the two new models. They both have the same engine, a Continental, block-cast with valves to the right. Thermo-syphon cooling is used, the radiator being of the cellular type in a sheet-metal casing. The Stromberg carbureter is fed by gravity from a tank beneath the seat. A Pierce governor, driven from the engine, is applied.

Ignition is furnished by an Eisemann single magneto with hand spark advance.

Supplied by Fuller, the clutch is of the dry-disk type and the gearset a three-speed selective unit, a single shaft extending back to the Sheldon worm-driven axle. Hotchkiss drive is taken by the half-elliptic Sheldon springs. Both brakes are on the rear wheels, placed side-by-side within the same drums.

The wheels are of wood, of Wayne manufacture. On the ¾-tonner, while solids are regularly specified, pneumatics will be supplied if preferred, 34 by 4 in front and 35 by 4½ in the rear. The steering wheel is at the left with the levers in the center.

CORBITT SPECIFICATIONS

Capacity, lbs	1,500	2,000	3,000	4,000	5,000	7,000
Price	$1,100	$1,300	$2,150	$2,400	$2,650	$3,200
Wheelbase, in.	130	130	138	148	148	168
Tires, front	34x3	34x3½	36x3½	36x3½	36x4	36x5
Tires, rear.	34x3½	34x4	36x5	36x3½d	36x4d	36x5d
Bore, in.	3¾	3¾	3¾	4⅛	4⅛	4½
Stroke, in.	5	5	5¼	5¼	5¼	5½
N. A. C. C. hp.	22.50	22.50	22.50	27.20	27.20	32.40
Speed, r. p. m.	1,200	1,200	1,500	1,500	1,500	1,500
Speed, m. p. h.	15	15	14	14	14	14
Gear-ratio in high gear	6½-1	6½-1	8 2/3-1	8 2/3-1	8 2/3-1	8¾-1
Final drive	worm	worm	worm	worm	worm	worm

Boston's Best Truck Show

(*Continued from page* 19)

kept in motion by means of an electric motor driving by belt a pulley mounted on the propeller shaft between the motor and the gearset. Through the action of the jackshaft differential, the free rear wheel was made to revolve. The tires of this wheel were utilized for advertising purposes by covering them with a painted canvas sign, the letters of which were easily read from left to right by revolving the wheel from right to left, as in reverse speed.

Aside from the purely truck exhibits, six makes of Ford adapters were shown, including the Hudford, Longford, Maxfer, Redden, Smith and Tonford. The Knox traction unit for converting either a new or used passenger car into a tractor capable of hauling from 2 to 3 tons, was also shown for the first time. This device, which consists of an internal-gear-driven axle, trailer platform and the necessary connections, takes the place of the rear axle and tonneau of the passenger car.

The Martin Rocking Fifth Wheel Co. exhibited a brand new type of supporting device for the front ends of old horse wagons used as trailers.

The Empire Axle Co., Dunkirk, N. Y., was the only exhibitor of axles in the show and displayed 1- and 7-ton worm-driven axles, the latter the type used on Hurlburt trucks of that capacity.

West steel wheels in various sizes were also shown, as was also a 5-ton bottom-dump Troy trailer.

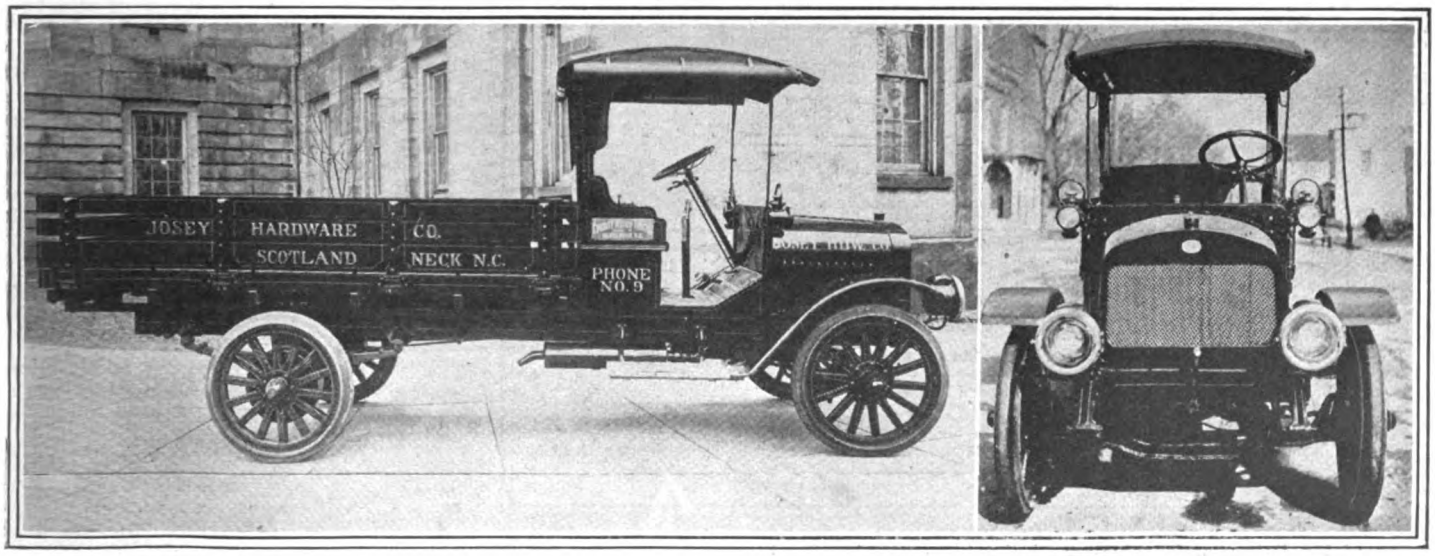


Fig. 7—Side and front views of the new 1-ton Corbitt

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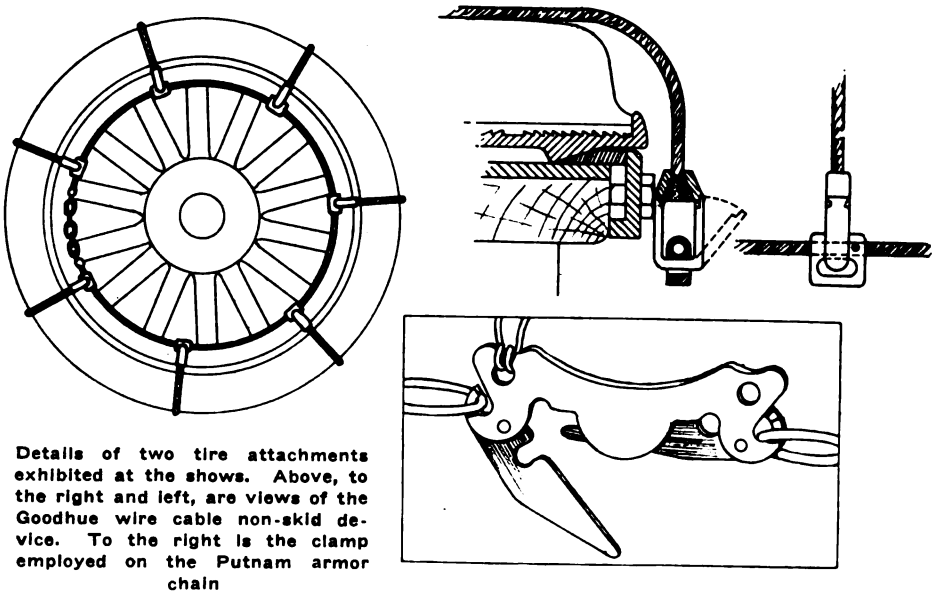
Five New Truck Accessories Appear At the Shows

Two Tire Attachments, Winch, Trailer Jack and Knock-down Bodies

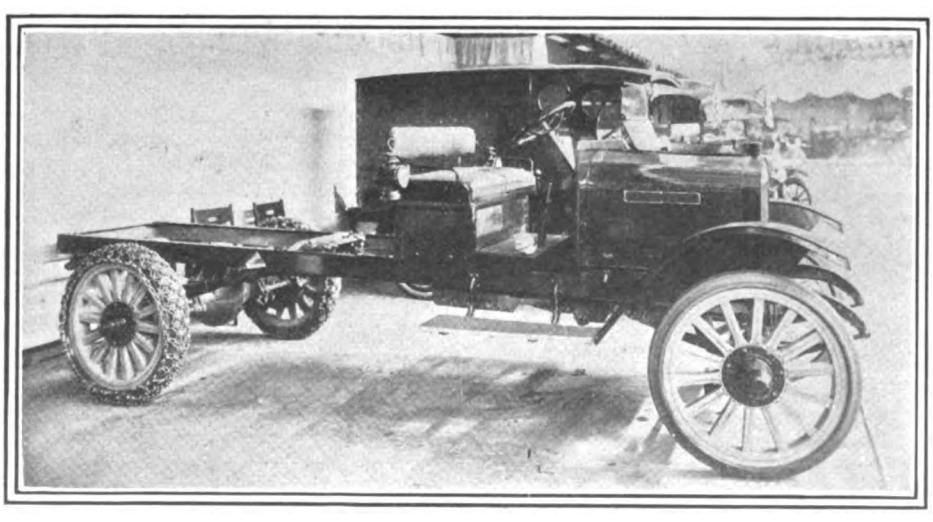
NEW motor truck accessories were exhibited at both the Boston and Brooklyn commercial vehicle shows. The most important of those seen at the Brooklyn exhibition included the novel type of body made by the McDermott Body Corp., Long Island City, N. Y., and described more fully on page 11 of this issue, and the Putnam armor chain for motor truck tires. That chain, illustrated on this page, is designed to give traction, to prevent skidding and to protect the tire.

Another new type of wire rope non-skid device was shown at the Boston show, at which were also exhibited a new type of semi-trailer supporting device and a new type of truck winch driven off the gearset of the vehicle.

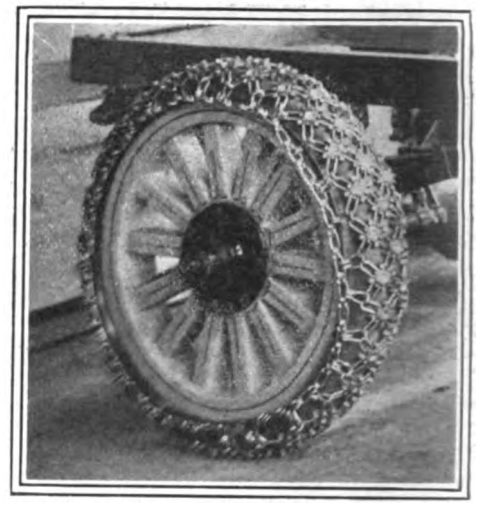
At Brooklyn a new tire chain made its appearance which has several features unlike anything before offered. This is the Putnam armor chain, which W. J. Putnam of Deposit, N. Y., is preparing the manufacture, having tested out several types. The name fits the chain exactly, for instead of an arrangement of cross-chains, it consists of a sort of chain mail completely enveloping the tire. The construction is clearly shown in accompanying illustrations.



Details of two tire attachments exhibited at the shows. Above, to the right and left, are views of the Goodhue wire cable non-skid device. To the right is the clamp employed on the Putnam armor chain



One of the D-E chassis exhibited at Brooklyn, showing the Putnam armor chain as it appears when applied on the tire



The Putnam armor chain applied to a truck tire, showing its snug fit

The basis of the mesh is a small square malleable casting with a slightly-curved inner surface to fit the shape of the tire and a cross-shaped pattern on the outside for traction. These are joined by forged chains in a diagonal mesh, the whole being retained at the rim by continuous wire chains. There is no mechanical connection with the wheel, so that to some extent the chain might creep, but in practice it is clamped so snugly that it does not creep.

This tightness, however does not cause it to cut the tire, as only the flat contact of the blocks presses on the tire and their combined area is such that the unit pressure is low. A notable feature of the chain is its silence. Further, the multiplicity of its road contact points prevents any bumping in use, wheel rolling practically as smoothly as any of the non-skid pneumatic tires. So thoroughly is the surface of the tire protected that it must be saved considerable wear, yet, the mesh is so open that there seems to be no reason to expect any restriction of the proper resiliency of a pneumatic.

The retaining clamp is designed to permit of three adjustments, as will be apparent from a study of the sketch and may be operated by the fingers without tools of any sort.

Some Boston Surprises

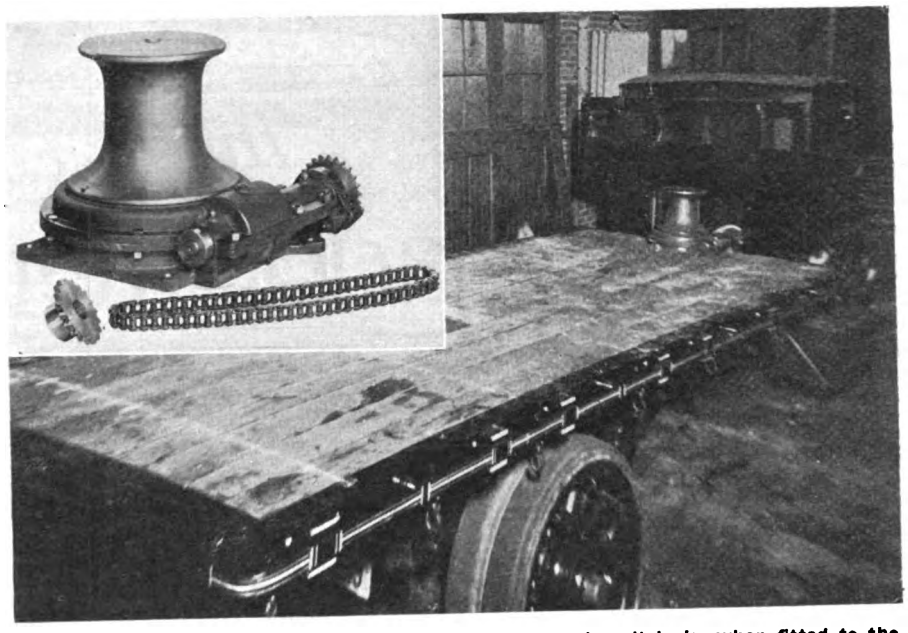
Like the Brooklyn show, that at Boston also served as the medium for the introduction of several new motor truck accessories which included a small truck winch, a wire rope non-skid tire device and a supporting means for light horse wagons used as semi-trailers behind converted passenger cars or light delivery vehicles.

The truck winch, a new type developed by the Mead-Morrison Mfg. Co., East Boston, Mass., is featured by its simplicity and the small space it occupies on the truck platform. It consists of a vertical winch head mounted on a base which occupies a space only 22 inches square. The winch is revolved through a worm wheel on the bottom of the winch shaft inside of the base casing. This also incloses the worm gear driven off the power-take-off shaft of the truck gearset

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by means of a chain and sprockets. The worm shaft is also characterized by the use of an automatic brake which is designed to prevent the backward turning of the winch head should the driving chain break. This device is a necessity when the winch is hoisting valuable materials such as pianos and safes, where a slipping of the hoisting rope due to a backward movement of the head might result in considerable damage to the goods being hoisted as well as other property in the immediate vicinity should the objects fall.

The winch is mounted on top of the truck platform directly aft the driver's cab as shown in the illustration on this page. It is adapted for all kinds of loading and hoisting and is really a time-saving device which should increase truck efficiency by enabling the loading and unloading times to be decreased with a resultant greater time for the actual running of the truck. The winch may also be used for hauling heavy objects such as machinery up on the truck body or for pulling the truck itself out of mud holes and ditches. The winch head is 8 in. in diameter and 11 in. long. The device weighs 350 pounds complete and is listed at $350 complete.



The new Mead-Morrison motor truck winch in detail and as it looks when fitted to the truck platform directly aft the driver's cab. It is adapted for hoisting safes and pianos, for hauling heavy pieces of machinery and the like on the truck body, or for pulling the truck itself out of mud holes and ditches. The winch is characterized by its simplicity and by the small amount of space, 22 inches square, which it occupies

Wire Rope Non-Skid

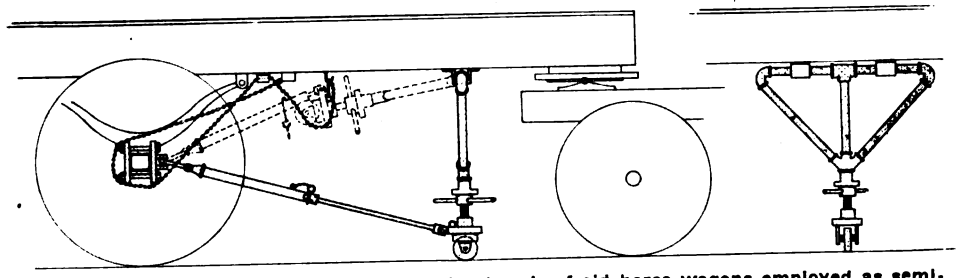
The new wire rope non-skid device exhibited is made by John Goodhue, Laconia, N. H., and consists of a series of wire cross ropes whose ends are leaded into U-shaped clamps as shown in the illustration on the opposite page. Each clamp is broken just below that portion inclosing the leaded end of the wire cross rope. This break is in an irregular shape much like that used on sets of puzzle blocks that children put together to show a complete picture.

This break is provided in order that a slotted block carrying a wire rope on each side of the wheel to hold the cross chains in proper relation to each other may be inserted inside of the U-shaped clamp. After each block is inserted in its clamp, the free end of the latter is bent up and locked into place so as to retain the block in position.

Each block is provided with a hole parallel with the side of the wheel felloe through which a smaller wire rope is inserted to hold all of the blocks in their relative positions. These blocks are not free on the side rope but each is made integral with it by means of a small pin as shown in the accompanying sketch. In this manner, the entire set of cross rope acts as a unit and is free to creep around the tire since none of the cross ropes are rigidly attached to any part of the wheel.

The end of each side rope is provided with a small link chain and snap clasp by means of which the cross chains may be put under a slight tension so that their tightness over the tread may be regulated as the tire wears away.

The device for supporting the front ends of former horse wagons used as semi-trailers behind passenger cars when it is desired to disconnect the trailers from the tractors for the unloading of the former is made by the Martin Rocking Fifth Wheel Co., Springfield, Mass. The device was especially designed for the benefit of owners using old horse wagons as semi-trailers in connection with the Martin patent fifth wheel and the various semi-trailer outfits made by the Martin company and fully described and illustrated in the February 1, 1917, issue of THE COMMERCIAL VEHICLE.



The new Martin supporting device for the front ends of old horse wagons employed as semi-trailers in back of converted passenger cars using the Martin patent fifth-wheel. The view at the right shows the vertical framework of the apparatus as seen from the rear. It is provided with a small wheel at the bottom which may be moved up and down to contact with the ground by means of the screw jack and turning handle illustrated. The dotted lines show how the device is held up off the ground while the trailer is in motion

Trailer Support Is Simple

The new supporting device is characterized by its simplicity and sells for $20 complete ready to attach. It consists of a main upright frame pivoted to the underside of the semi-trailer near the front end and a telescoping bar attached to the axle of the trailer to keep it upright while the latter is being moved from place to place for unloading or while one trailer is being substituted for another. By the use of such a device, one converted passenger car may be used with any number of trailers so that the power vehicle can be in actual motion for the greatest possible time, one trailer being unloaded or loaded while the vehicle is delivering the load in another.

The main frame is made up of pieces of pipe joined by means of pipe elbows. The center vertical pipe is provided with a Y-shaped coupling at the bottom in which are inserted two pipes which branch off like the limbs of a tree and are joined at the top by a horizontal pipe carried in two U-shaped brackets attached to the underside of the trailer.

A screw jack with a turning handle is inserted in the bottom of the Y coupling and carries a pedestal at the extreme bottom with a small wheel that contacts with the ground. The pedestal has a small yoke at the rear to which is connected a telescoping bar attached to the trailer axle on a pivot bracket.

When the supporting frame is not in use as when the trailer is being pulled by the tractor vehicle, the telescoping bar is shortened and the frame swung upward off the ground to the rear, as shown in the sketch on this page. It is held in this elevated position out of contact with the road by means of a small chain which forms a part of the device and which is wound around the base of the frame and then slipped over a hook beneath the trailer body and finally anchored there after being passed around the trailer axle to prevent the telescoping bar from dropping down.

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Devoted to topics pertinent to commercial vehicle operation design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

THE RADIUS ROD, PRO AND CON

Hotchkiss Drive Has Advantages, But Is More Expensive in Big Trucks

To the Editor, COMMERCIAL VEHICLE:

We have been having some discussion on the necessity of or advisability of putting radius rods on a truck of 2 tons capacity. Will you inform me if you favor Hotchkiss drive on trucks of this capacity, and if so, why? If you favor the use of radius rods, will you inform me why?—MILO, New York City.

Like most questions of this nature, the fact that well-reputed companies employ both forms of construction and trucks built both ways manage to give good service, proclaims loudly that there are merits to both forms of structure. Unquestionably Hotchkiss drive for both trucks and passenger vehicles is gaining ground. The reasons for this are as follows:

1—Flexibility. It eliminates rigid connection between the axle and frame. It gives easier riding because road shocks are never transmitted solidly to the frame, but always through the springs. It cushions the drive, thus in some small measure, at least, lessening the shocks to the driving parts and the engine.

2—Simplicity. It eliminates a number of parts.

3—Silence. Radius rods sometimes rattle, but not always or necessarily.

4—Lubrication simplification. Reducing the number of wearing surfaces, it likewise reduces the number of points requiring lubricating attention.

5—Economy. On lighter vehicles Hotchkiss drive represents a cheaper construction, but in larger ones it means more expense. It is difficult to determine where the 2-tonner should be placed in relation to this phase.

6—Better worm-gear action. The cushioned drive is said to be better for worm drives because intense momentary pressures, such as are exerted in starting, are reduced and distributed through a longer period of time, decreasing the maximum moment.

On the other hand, in heavier trucks a great many manufacturers who have experimented with Hotchkiss drive and fully realize its advantages have applied radius rods because the stress upon the springs becomes so great that nothing but very high-grade and therefore exceedingly expensive springs may be used. It is thought by many of these that by using the springs for torque and the radius rods for propulsion, equally good, or nearly so, worm gear action may be secured, since the axle is free to twist to a certain extent under starting torque, with springs of standard quality. In other words, these makers do not think that the advantages of full Hotchkiss drive are worth the extra expense of fitting springs capable of taking propulsion.

There is also some fear in the minds of some engineers that the Hotchkiss drive is unsafe, since the retention of the axle in its proper place depends entirely upon the springs. Should a spring give way, there is fear that the axle will be pulled out of line unexpectedly and the truck will be ditched. For this reason various forms of double spring eyes have been developed, notably as on the Rainier and Fulton trucks.

Apparently, in a 2-ton truck, if springs of sufficiently high grade material are used and they are built up with the top leaf much heavier than the others, there is nothing unsafe about Hotchkiss drive and there are many advantages.

UNDER-ONE-ROOF TRUCK MAKES

Vehicles of ¼- and 2-ton Capacity Which Are Mainly Manufactured

To the Editor, COMMERCIAL VEHICLE:

Can you tell us from your records how many 2-ton and ¾-ton trucks there are on the market that are strictly manufactured propositions—such as the X..... By that I mean trucks whose radiator, motor, clutch, transmission, axles and steering gear are manufactured in the plant of the company that turns out the truck?—W. C. P., Lansing, Mich.

There are six other ¾-tonners and thirteen other 2-tonners assembled from parts, as stated above, manufactured in the plants of their builders, a total of fourteen different makes of both capacities.

HOW TO ESTIMATE TRUCK COSTS

Analysis of Probable Performance and Outline of Expenses

To the Editor, COMMERCIAL VEHICLE:

In connection with some contemplated government work I am writing you unofficially to obtain some information in regard to the operation of motor trucks. We are figuring on using a number of 5-ton motor trucks for distributing coal to various government activities in this city. I would like to know what the total cost would be for running such machines, that is, approximate first cost, depreciation, cost per mile for gasoline, lubricating oil, tires, etc., considering they are running under full load half of the time. The streets here are practically all asphalt and the haul would be over level ground. The average distance of haul would probably be 1½ miles, while the longest would be 3 or 4 miles.—G. W. A., Washington, D. C.

One important factor is omitted, this being the traffic conditions as relate to possible sustained speed. If traffic is congested so that it will not be possible for the vehicles to run at their full speed, the amount of work they will be able to do in a day will be materially cut down. On the other hand, if traffic is free and the vehicles are able to average close to their maximum governed speeds, the effect upon unit costs will be favorable. In this it must be borne in mind that mere costs without taking into consideration the amount of work done have little value in determining the economy of truck installations as against horse transportation.

If traffic is favorable, a road speed of 10 miles per hour should be practicable, as an average. The next important thing to be considered is loading and unloading conditions. Naturally the more time spent standing at each end of the route, the less work the truck will be able to do and therefore the greater the cost per ton-mile. With overhead hoppers for loading and facilities for unloading by a dumping gear, very little idle time would be suffered.

It is to be assumed that the trucks will work a total of 10 hours per day. The operation of running into the yard, weighing in empty, maneuvering to the loading position, taking the load, weighing out and reaching the street again may be considered loading time. In a pinch, this might be done in a very short time, but in actual practice 15 minutes

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may be considered a normal consumption of time for this operation.

Dumping the load by means of an engine-driven mechanical dumping gear should not take longer than 5 minutes from the time the wheels stop revolving until the truck starts on its return trip. This presupposes no unnecessary clerical delays at either end.

On a haul of 1½ miles at 10 miles per hour, the running time for the round trip, or 3 miles, should be 3/10 hour, or 18 minutes. The total time per trip should therefore be $15 + 5 + 18 = 38$. In 10 hours, or 600 minutes, therefore, the number of possible trips would be $\frac{600}{38} = 15$, with 30 minutes to spare. In this day's work the truck would deliver, if loaded fully one way each trip, 75 tons of coal. On each trip the commercial ton-mileage* would be $3 \times 5 = 15$, and in 15 trips 225 ton-miles.

It is vain to attempt an estimate of operating costs in advance with any hope of accuracy, owing to the dominating effect of certain unknown factors. The best that THE COMMERCIAL VEHICLE can consistently attempt to do is to give an outline of what items should be considered, allowing G. W. A. to supply his own figures from his own data.

The average 5-ton truck chassis on the American market to-day costs in round figures $4,200. A steel dumping body with an engine-driven hoist will cost $650, perhaps, a total of $4,850. Tires, 36 by 6, for the front will cost $65, and 40 by 6, dual, for the rear, $145 per pair. These tires are usually adjusted on a 7000-mile basis, although other makes are guaranteed for 10,000 miles. Taking the more conservative figure, however, this makes the tire cost $320 for 7000 miles, or $0.0457 per mile.

It is customary to charge 20 per cent depreciation on truck chassis and 6 per cent interest on the investment, including the cost of the tires and body. Insurance costs vary greatly with the locality, amount of coverage and conditions of service. These rates also depend upon the company chosen, insurance in the older and stronger concerns being slightly higher than in some of the non-conference companies. If a concern decides to carry its own insurance risk, a charge equal to the premium which would be charged by an insurance company should nevertheless be entered against the truck.

Repairs depend entirely upon the care which the chassis are given, the excellence of the truck selected and the conditions of service, and are therefore impossible to forecast, but for a rough-and-ready estimate, 10 per cent of the chassis cost may be taken, in this case $420 a year.

In a month of 25 days, therefore, a cost estimate would be made up about as follows:

Per 5-ton truck:

Fixed Charges	
Insurance	$.....
Interest at 6%	24.25
Depreciation at 20%	80.16
Taxes and licenses	.....
Maintenance Charges	
Tires, 1250 miles, at $0.0457	$57.12
Repairs at 10%	35.00
Overhauling, painting, etc	.....
Spare vehicle rental	.....
Garage rental	.....
Operating Charges	
Gasoline, ... gal., at ...c	$.....
Oil, ... gal., at ...c	.....
Kerosene, ... gal., at ...c	.....
Waste, ... lbs., at ...c	.....
Washer's time at ...c. per hr	.....
Driver's time at ...c. per hr	.....
Helper's time at ...c. per hr	.....
Mechanic's time at ...c. per hr.	.....
Miscellaneous	.....
Total cost	$.....
Total miles	1250
Total tonnage	1875
Commercial ton-mileage*	5625
Cost per ton-mile	$.....

*The commercial ton-mile is figured by multiplying the total mileage on each trip by the total tonnage transported on that trip.

WHO MAKES SPECIAL ICE BODIES?

Nutmeg Reader Wants List of Manufacturers of Standard Types

To the Editor, COMMERCIAL VEHICLE:

Will you please inform me if there are any special bodies made for trucks used in the ice business and, if so, the names and addresses of the firms making them?—J. S., Hartford, Conn.

THE COMMERCIAL VEHICLE knows of no firms which manufacture special types of standard ice bodies or which specialize in this class of equipment. Ice bodies for motor trucks are usually made to order by body builders. Almost any manufacturer of truck bodies can supply bodies of this type.

PARTS FOR SPEEDWELL TRUCK

To the Editor, COMMERCIAL VEHICLE:

Can you give us the name and address of the manufacturer of the Speedwell motor truck? We have been informed that the manufacture of the truck has been discontinued, in which case, if you know of any concern in a position to furnish parts or repairs, please give us this information.—F. E. SCHROEDER, E. D. & A. F. Cronk, Inc., Utica, N. Y.

The Speedwell was manufactured by the Speedwell Motor Car Co., Dayton, O., but that company is no longer in business. Repair parts are carried by the Auto Salvage Co., Seventeenth and Main streets, Kansas City, Mo., and by the Puritan Machine Co., 408 Lafayette boulevard, Detroit.

FOUR MAKERS OF GOVERNORS

Duplex, Monarch, Pierce and Steele Devices on General Market

To the Editor, COMMERCIAL VEHICLE:

We are converting a high-power, seven-passenger pleasure car into a commercial truck, and wish to secure a device or governor which will enable us to control the maximum speed at about 18 to 20 miles per hour. We have already written the Pierce Governor Co., and request that you please advise the name of any other manufacturer or supplier we may write to, to secure the device we wish to have.—C. J. SCHNELLE, purchasing agent, Acme Wire Co., New Haven, Conn.

Governor makers are:

Duplex Engine Governor Co., New York City.

Monarch Governor Co., Detroit, Mich.

Pierce Governor Co., Anderson, Ind.

W. M. Steele, Worcester, Mass.

PARCEL DELIVERY INTERESTS DENVERITES

To the Editor, COMMERCIAL VEHICLE:

Some few weeks ago I read an extensive article on the merchants' package delivery business. I forget, however, the title under which it was written.

Please advise if this is your paper and if I can secure the back numbers containing same. I would be glad to have you advise me how many cities, or States, of which you are aware, that have this centralized system of package deliveries.—W. F. DREKER, Denver, Col.

The article referred to is no doubt that concerning the Clearing House Parcel Delivery Co., Boston, Mass., appearing as a leading article in THE COMMERCIAL VEHICLE of Dec. 1, 1916, under the heading, "Achievement of Success in Parcel Work Due to Co-ordinated Efficiency."

There are few such systems in use, due to the fact that, as the article above referred to states: "Many companies formed and operated for the work of delivering the packages of several department stores, etc., have failed because their trucks were not maintained properly, or because the profits obtained through efficient truck operation were eaten up by poor internal handling methods. Men who seek success in the formation of such a company must not only be experts on truck operation, but also experts in department store package-handling systems."

Besides Boston, there are very few cities which use this sort of service. Formerly there was a Merchants' Parcel Service Co. in Chicago, but this failed. A service of this nature was started some time ago in Springfield, Ill., but its present status is not known. It is understood that a successful parcel delivery service is performed in Scranton, Pa. In a modified form the same thing exists in New York City, the James McCreery Co. and Lord & Taylor, both large dry goods stores, having a common delivery service performed by the Eleto Co.

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Men and Makers

FORD MOTOR CO., Detroit, is installing two 75,000 hp. engines in its new plant at Delray, Mich.

Federal Motor Truck Co., New York, has published a thirty-two-page booklet printed in English, French and Spanish, showing the truck put to various commercial uses, giving a picture of the plant and a detailed description of the chassis. Every bit of descriptive matter, including captions, is printed in each of the three languages. The company has also issued a double number of the Federal Traffic News in honor of the Boston show. The contributions are all by New England representatives of the company.

The White Co., Cleveland, Ohio, has issued a fifty-eight-page booklet containing many photographs which show the White truck doing a great variety of commercial work in various sections of the United States. At the end of the book are given the specifications and the warranty which goes with the White truck.

Studebaker Corp. will move its advertising and sales departments now at Detroit to the main offices at South Bend, Ind., about April 1.

Fulton Motor Truck Co., Farmingdale, N. Y., has begun additions to its plant, which will enable it to produce 2000 trucks a year, or double the present capacity. The factory is working on a 24-hour schedule.

Durable Motor Truck Co., Hammond, Ind., has purchased a factory building and will begin manufacturing small trucks at once. The company has been incorporated for $500,000, and has the following officers: Joseph Studer, president; Charles A. Foss, treasurer; C. Brown, secretary.

Duplex Truck Co., Lansing, Mich., has contracted for plans for a $1,000,000 plant to be erected on a 15-acre tract recently purchased by the company.

Miller Auto Sales Co., Grand Rapids, Mich., will manufacture a new truck known as Mil-Ton. W. C. Miller has been made president and general sales manager of the company, L. W. Coppeck vice-president, and L. A. Corcora secretary and treasurer.

Denby Motor Truck Co., Detroit, has issued a catalog showing fleets of its trucks in the service of the post-office department, in use by the New York City water and electrical departments, and a group on the Cunard piers destined for England. The booklet also contains pictures of the truck in various forms of commercial service, and describes the chassis and various parts of the construction in detail.

Willys-Overland's Kansas City branch has moved into its new building. The new structure is six stories in height, has 7 acres of floor space and cost nearly $1,000,000.

D. A. Odell Motor Car Co., Minneapolis, Minn., has purchased the Waldref Motor Car Co. of St. Paul, distributor of Pierce-Arrow.

Koehler agencies recently placed are: C. F. Smith, Beloit, Wis.; North End Garage, Newburgh, N. Y.; Whitaker & Son, Unadilla, N. Y.; W. E. Chumney, Georgetown, Tex.; A. W. Arbogast, Ronceverte, W. Va.

Kisselkar dealers recently established are: H. W. Meyers, Austin, Tex.; Pirie Motor Car Co. of St. Paul, distributor of Hull, Mass.; H. V. Truitt & Son, Huntington, W. Va.; A. Schiavini, Clinton, Mass.; E. E. Wentworth, Springvale, Me.; J. F. Carter, Temple, Tex.; C. L. Young, Norfolk, Va.; Rochester Motor Car Co., Rochester, Minn.; Eckman Bros., Eyota, Minn.

Lawrence Motor Sales Corp. has been appointed distributer of the Fulton truck for the Greater New York district.

Gray, Reardon, Newlin Co., Dallas, Tex., has been named Pierce-Arrow distributer in Texas and Oklahoma.

Columbia Axle Co., Cleveland, Ohio, has added 100 hands to its factory force. The Columbia company expects to double its production of last year and make 30,000 axles in 1917.

Racine Mfg. Co., Racine, Wis., is employing a night shift regularly at the present time in order to handle the orders on hand for commercial bodies.

Budd Wheel Corp., Philadelphia, Pa., is now actively engaged in the production of steel and wire wheels. The company was organized several months ago.

B. F. Goodrich Rubber Co., Akron, Ohio, opened a branch at Fort Wayne early in March. E. A. Meek is in charge.

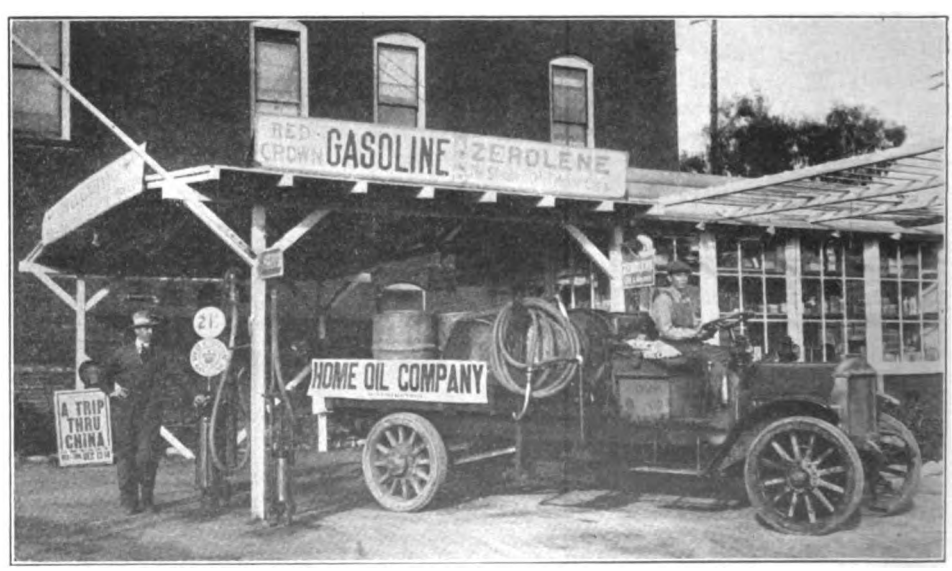
Federal Rubber Co., Milwaukee, Wis., is planning an addition to its power plant, to cost about $200,000.

Globe Tire Mfg. Co., Trenton, N. J., has purchased 12 acres of land as a site for an addition to the present factory.

Acme Tire & Rubber Co. will build a plant in Oakville, Ont., for the manufacture of rubber tires and goods.

Kelly Field Co., selling agents for the Lee Tire & Rubber Co., is moving its offices from 1851 Broadway, New York, to the home offices and factory of the Lee company at Conshohocken, Pa.

Brown Spring Oiler Co. has obtained Patent No. 1,215,904, issued in the name of William H. Brown, covering a spring



Four hundred and twenty gallons of oil can be unloaded from the drum of the Federal oil truck, shown above, in 14 min. The engineer of the Home Oil Co. designed the engine-driven pumping device which makes the quick unloading possible. The apparatus takes its power from the flywheel of the truck by a friction wheel made of paper composition

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oiler device. This device carries a felt wick or reservoir for oil which is clamped at the side of leaf springs to lubricate them.

Ericsson Mfg. Co. has opened a New York branch, in charge of H. E. Walker, at 51 East Forty-second Street.

John N. Willys, president of the Willys-Overland Co., is taking a 30 days' vacation in the South.

H. T. Dunn has notified the board of directors of the Willys-Overland company that he will resign his position as vice-president of the company May 1. The action is taken in order that Dunn may devote more time to the Fisk and Federal Rubber companies, of which he is president.

W. R. McCulla, engineer for the Willys-Overland Co., is now under service orders of the English army, which he joined at the time of his trip to the war fronts for the Knox Motors Co., maker of Knox tractors.

Sidney D. Waldon, formerly vice-president of the Packard Motor Car Co., has been appointed captain of the aviation section of the United States army and signal officer in the reserve corps.

J. H. Anderson, assistant controller of the Maxwell Motor Co., Inc., will resign on March 15 to enter into other business in New York City.

W. G. Langdon has joined the purchasing department of the Willys-Overland Co., Toledo, Ohio. He was formerly purchasing agent for the Hayes Mfg. Co., Detroit.

S. S. Merrithew, traffic engineer of the Federal Motor Truck Co., has resigned to accept a similar position with Packard under R. C. Hargreaves.

L. E. Miller has been appointed advertising and sales engineer of the Sterling Motor Truck Co., Milwaukee, Wis. He was formerly advertising manager of the Free Sewing Machine Co., Rockford, Ill.

E. A. Kingsbury has resigned as secretary of the Chase Motor Truck Co., Syracuse, N. Y., to join the organization of the Sanford Motor Truck Co., in the same city.

W. A. Clare, general sales manager of the Atterbury Motor Car Co., Buffalo, N. Y., returned to the factory on February 23 from a 3 weeks' trip to New Orleans, Birmingham, Atlanta, Chatanooga, Nashville and Cincinnati.

C. E. Fay has resigned his connection with the New England branch of the Ford Motor Co., Boston, Mass. He has been with the branch for over 11 years, and was in charge of sales and supervisor of the assembling plant in Cambridge, Mass. His future plans have not been announced.

J. J. Harrington has been appointed New England manager for the Ford Motor Co.

J. H. McDuffee has been made manager of the Chicago branch of Willys-Overland, Inc. He has been assistant sales manager of the company.

C. W. Price has sold his interests in the Overland Motor Co., Chicago, to Willys-Overland, Inc., Toledo. Mr. Price, who has been distributer of the Overland for the Chicago district, has retired because of ill health and the desire to devote his time to other financial interests.

James A. Harris has been placed in charge of the Philadelphia branch of the Polack Tyre & Rubber Co. He was formerly Southern manager for the company. It was erroneously stated in THE COMMERCIAL VEHICLE for Feb. 1 that Maxwell Smolen would have charge of the Philadelphia branch. Mr. Smolen is no longer with this company.

F. B. Drouillard has been appointed as superintendent of the new Maxwell plant in St. Louis.

O. G. Bennett died suddenly last week at Kenosha, Wis., from an attack of pneumonia. Mr. Bennett was at the Nash Motors Co. factory at the time developing plans which he had been organizing for some time to distribute Nash products in the Southwest.

Fred T. Nesbit has been appointed distributer of Commerce trucks for the Greater New York territory.

Stanley E. Bates has been appointed sales manager of the Lee Loader & Body Co., Chicago. He was formerly editor and manager of *The Contractor*.

H. G. Weymouth has been appointed general superintendent of the Torbensen Axle Co., Cleveland, Ohio. He was formerly general superintendent of the National Equipment Co., Springfield, Mass.

Harry L. Bill has resigned as vice-president and general manager of the Springfield Body Corp., Detroit and Springfield, Mass. The action is due to illness and a death in the family.

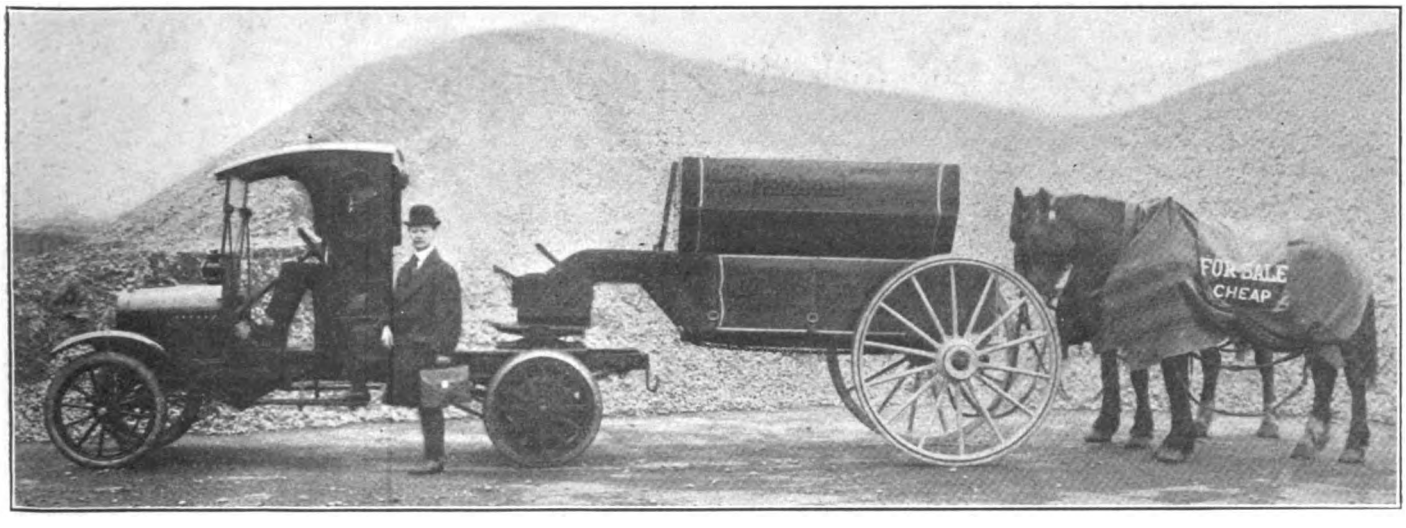
Herbert Maise has resigned as chief engineer of the Springfield Body Co., Detroit.

L. D. Brown has been appointed treasurer of the B. F. Goodrich Co., Akron, Ohio. He was formerly cashier of the First National Bank, Akron.

Charles E. Guest has been appointed manager of the Manila branch of the United States Rubber Co., New York. He formerly represented the company in Mexico.

H. L. McClaren has been elected vice-president and sales manager of the Ajax Rubber Co. He has been president and general manager of the Racine Rubber Co., recently purchased by Ajax.

J. B. Linerd has been appointed general manager and a director of the Globe



A realistic method of advertising its product has been adopted by the Union Truck Mfg. Co., New York City, which employed one of its converted Ford units with a fifth-wheel on the rear end to support the front of an ordinary horse wagon, the animals trailing along behind. The idea intended to be conveyed to the horse owner is that he may drive his wagon up to the Union plant, remove the front pair of wheels, support the wagon on the rear end of the converted Ford and depart with the horses haltered at the rear and with the sign, for sale cheap, painted on their blankets. The converted Ford tractor is capable of pulling 3 tons in the steel-tired semi-trailer made from the old horse wagon, provided the latter was originally built to carry that load

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Tire Mfg. Co., Trenton, N. J. He was formerly with the Goodyear and Ajax companies.

F. Y. Horn has been named district manager of the Amazon Rubber Co., Akron, Ohio. His headquarters will be in Chicago.

H. E. Bradner has been elected president of the Auto Body Co., Lansing, Mich. Fred C. Ruch has been made secretary.

V. A. Neilson has resigned his position as engineer for the Apple Electric Co. and for the Splitdorf Electrical Co.

Ludwig Arnson has been appointed Detroit representative of the Duplex Engine Governor Co. He has been for 4 years sales manager of the Longuemare Carbureter Co.

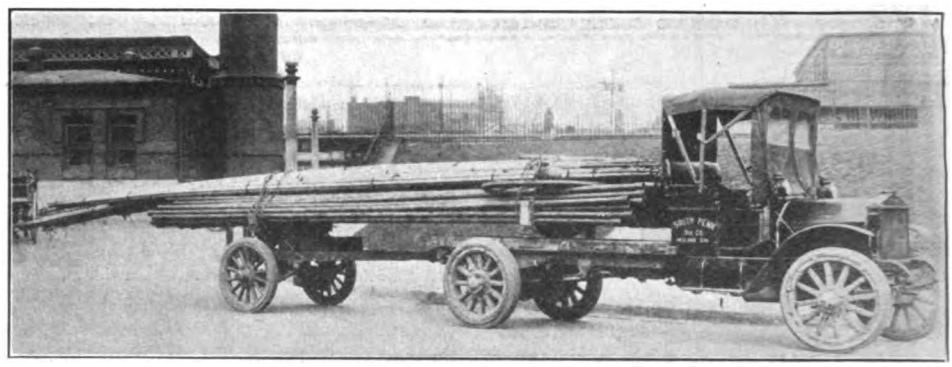
A. H. Bartsch has been named as secretary of the McLain, Haddon & Simpers Co., New York, advertising and merchandising counsels. He has been for 7 years advertising manager of the Bosch Magneto Co.

H. W. Kriedler has been appointed chief engineer and **C. G. Spice** experimental engineer of the Detroit Lubricator Co.

H. T. Cope has joined the Bantam Ball Bearing Co. as sales engineer. He was formerly secretary and treasurer of the Trio Mfg. Co., Detroit.

Neil Macneale has been made general manager of the Corcoran Victor Co., lamp maker, Cincinnati, Ohio.

Robert S. Westcott has been appointed advertising manager of the Bosch Magneto Co., with offices in New York. He has been assistant advertising manager.



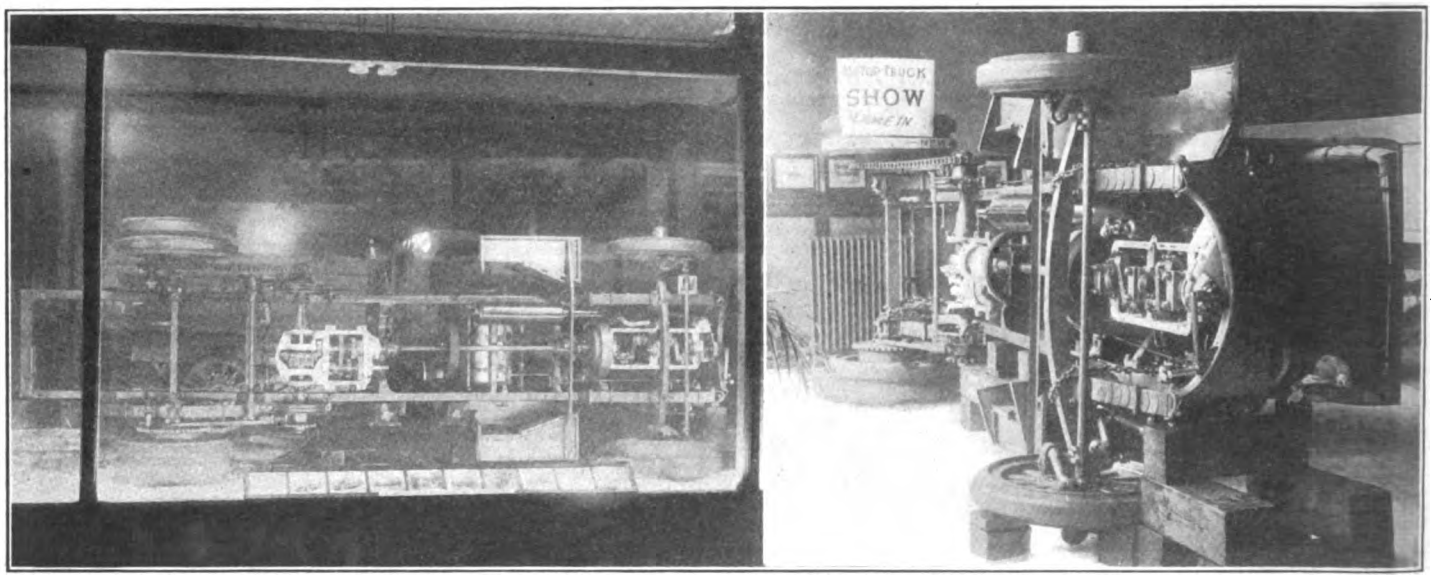
Considerable carrying power is added to the Federal trucks of the South Penn Oil Co. by the use of the semi-trailer pictured above. This device is yoked to the rear end of the chassis. That the trailer bears the chief burden of the weight is noticeable by the flattening of the rubber tires used on the trailer wheels

George W. Dunham is working at present on the development of a tractor. Mr. Dunham is president of the Society of Automobile Engineers, and has offices as a consulting engineer in Detroit.

Boice-Perrine Co., Boston, Mass., has just been appointed New England distributor for the White Star Refining Co., Detroit, refiners of the lubricating oil used exclusively by the Ford Motor Car Co., Detroit, and by all of its branches throughout the United States and Canada.

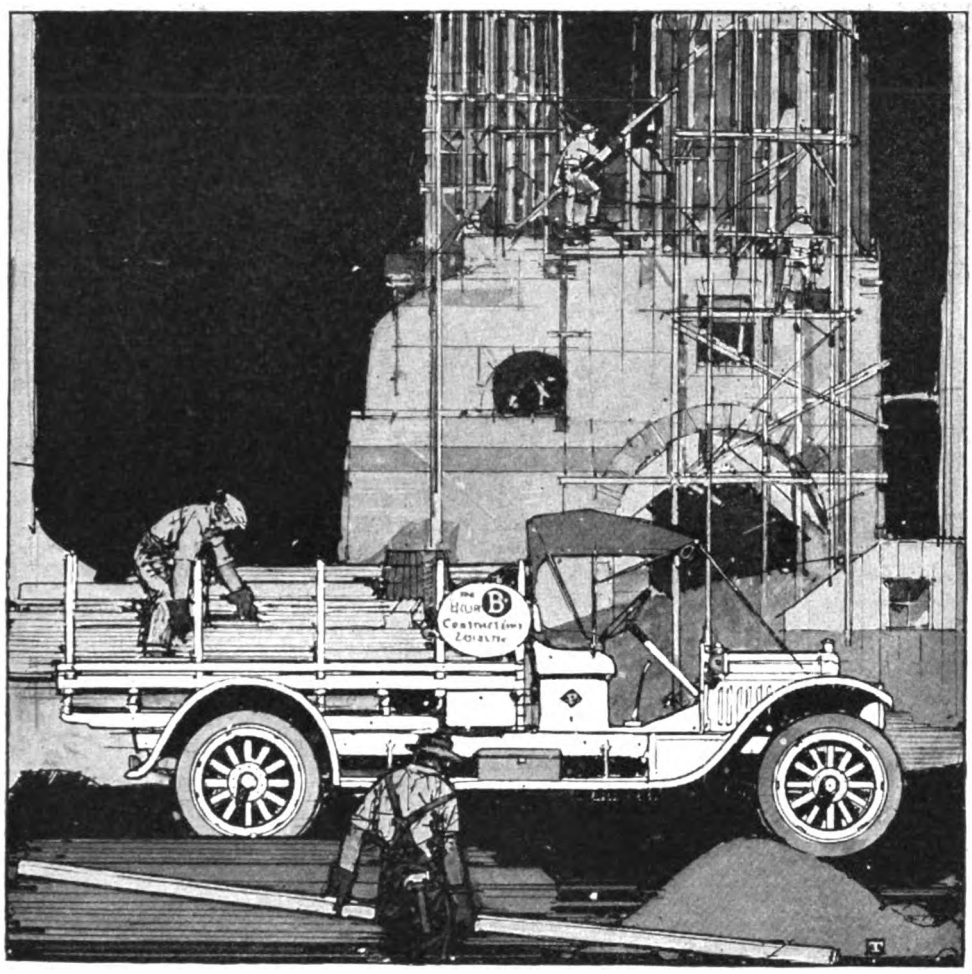
Madrid, Spain, needs motor trucks. A municipal decree has ordered that all the present cobblestone pavements be replaced by asphalt or similar road material within 2 years. This will open a big trucking field. The duty on motor trucks is $7.72 each 220 lbs. net weight, but a chassis alone is taxed at $15.44 per 220 lbs. if gross weight under 2200 lbs., and $19.30 per 220 lbs. gross weight if over 2200 lbs. It appears advantageous therefore to ship chassis and body together.

Motor Trucks of America, Vol. 5, has been issued by the B. F. Goodrich Co., Akron, Ohio. The feature of the book this year is an introduction by S. V. Norton, manager of the Goodrich company's truck tire sales department, on the subject of lengthening the life of the motor truck. He points out the dangers of the common fault of overloading, showing how it affects the axles, wheels, brakes, springs, tires, frame, engine and transmission. He then shows how overspeeding damages the truck and gives directions for careful driving. The introduction is followed by specifications and photographs of the standard trucks, furnished by the manufacturers, and concludes with a description of Goodrich truck tires.



The above exhibit, first shown in the window of the Chicago branch of the International Motor Co., New York City, during the motor vehicle show in Chicago, attracted such a great deal of attention that the same idea was followed out in the exhibition of one of the Mack models at the Boston truck show, which closed last week. In both instances the novelty of turning a chassis over on its side and then setting the various moving parts in motion by means of an electric motor driving a pulley on the propeller shaft through a belt created such a tremendous amount of interest that the International company is planning to install a similar exhibit in the downtown financial district of New York City and another in Philadelphia, Pa. As explained elsewhere in this issue, the 7½-ton Mack truck turned over on its side at the Boston show enabled the dealer who exhibited it to obtain a greater number of live prospects than he had ever got before at a similar show. The method of turning the chassis over on its side also brings out the accessibility feature of the Mack AC models, in each of which it is possible to inspect and get at the motor, gearset and jackshaft by removing a bottom instead of a top cover in each case. This method of inspecting these parts from the bottom instead of the top is very convenient in that it often saves the trouble of taking off the truck body to do effective work on either the gearset or jackshaft

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WHITE TRUCKS

YEARS of adjustment, refinement and correction in the design and construction of motor trucks has given The White Company a practical knowledge of this work which cannot be gained in any other way. The result shows in the test of actual service. Under the racking strain of continuous year-around demands, the White Truck stands up to its work with fewer days off for repairs than any other make of truck of which we have record.

The broad experience behind White Construction has been supported by the largest motor truck output of any manufacturer in America; it covers every type of truck used.

THE WHITE COMPANY

CLEVELAND

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An Oregon Contractor's Packard

KELLY-SPRINGFIELD
Triplet Tires



using Kelly Triplets with success



A Mack truck doing heavy hauling for a California cannery

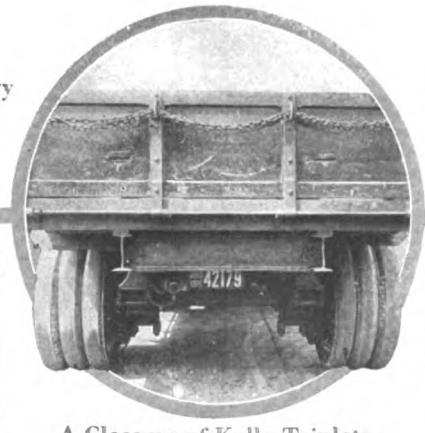
KELLY-SPRINGFIELD Truck Tires in triplet form are becoming popular throughout the United States because of their greater tractive quality, for the actual saving in tire cost and because of the reduction of wear and tear on trucks. Where, for example, three 40x5 tires replace two 40x7's, the wheel weight is reduced 234 lbs. and the cost of replacement of a 40x5 single tire is one-third less than in the case of renewing one 40x7.

Kelly-Springfield Truck Tires are of that quality one would naturally expect to find in a product which has stood the test of twenty years and retained during that period its leadership, not upon extravagant claims, but by actual service delivered.

Kelly-Springfield Tire Co. General Offices, Broadway at 57th Street, New York
General Sales Dept., 1900 Euclid Avenue, Cleveland, Ohio

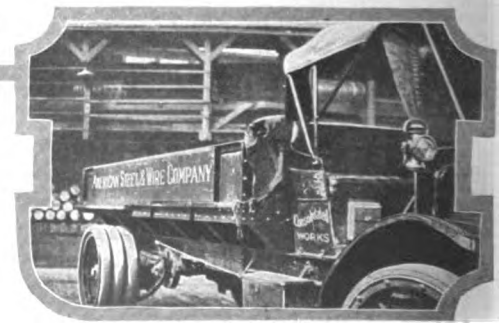
A White truck used in heavy



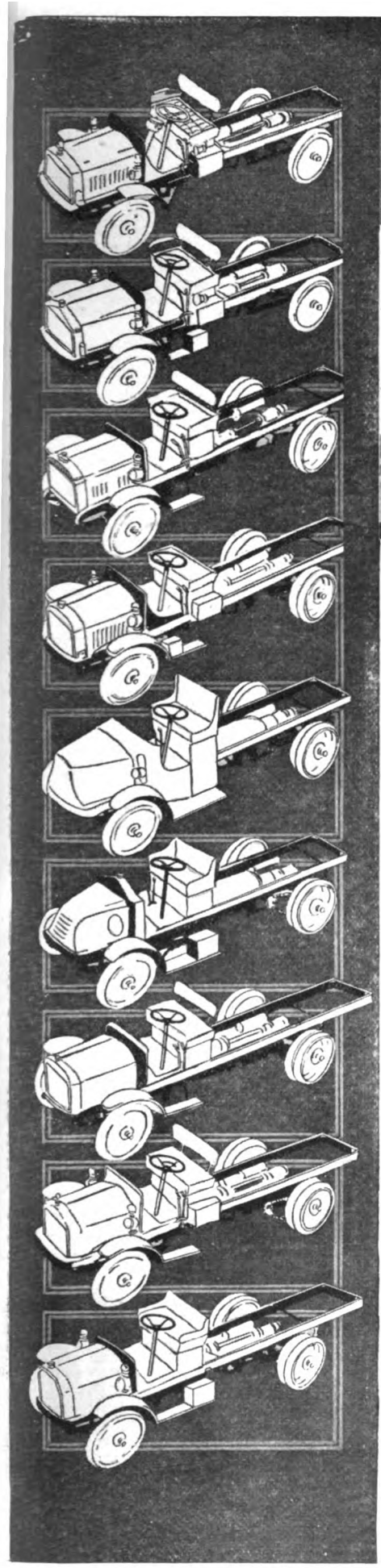


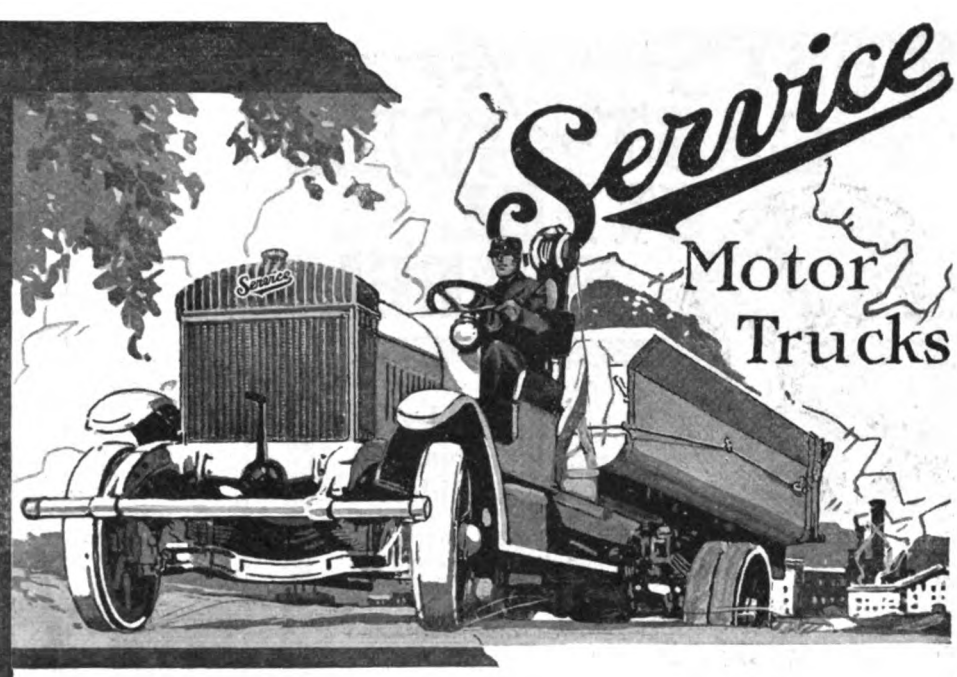
A Close-up of Kelly Triplets

service in Cleveland, Ohio



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Choose from the Dominant Ten

Base Your Choice of Motor Trucks on Specifications

You demand strength—economy—high service achievement—durability—specialized mechanical development in your motor truck.

Big buyers whose individual orders range from one to fleet equipment, who buy on proved specifications, confine their choice to ten big dominant manufacturers.

Definite Features of Advantage Among the ten dominant manufactures, SERVICE trucks stand out with certain very definite featurers of advantage—the result of the most exhaustive investigation of motor truck requirements.

Six Chassis—One to Five Tons SERVICE motor trucks are designed in six chassis sizes. Each is as individual as though it were the only model built—each is refined—developed—individually built for the work it has to do.

20% Super-Strength

Among the dominant ten manufacturers whose product finds biggest use among careful buyers, SERVICE Motor Trucks stand out with 20% super-strength. Frame, springs, motor, worm drive construction—the truck throughout shows super-efficiency—super-strength—super-development of manufacturing ingenuity.

Yet with this super-strength—this super-design—SERVICE motor trucks are notably light, adding to wonderful road stamina, real remarkable economy.

67% of SERVICE truck sales were Re-orders in 1916
60% of SERVICE truck sales were Re-orders in 1915

Models to Meet Your Requirements

1 ton truck - $1425	2 ton truck - $2350	3½ ton truck (Special Contractors) $3350
1½ ton truck - 2100	3½ ton truck - 3100	5 ton truck - - - 4150

13 Point Booklet

Send for our big Illustrated Thirteen Point Booklet. It will give you just the information you are looking for.

Service Motor Truck Company
Main Office and Factory: Wabash, Ind.
Dept. V-3

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St. Louis, Mo.	Buffalo, N. Y.	Cincinnati, Ohio	Hoboken, N. J.	Memphis, Tenn.
Louisville, Ky.	Salt Lake City, Utah	Youngstown, Ohio	Philadelphia, Pa.	Birmingham, Ala.
Omaha, Neb.	Milwaukee, Wis.	Canton, Ohio	Rochester, N. Y.	Dayton, Ohio
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Whitney Chains are strong, accurate and dependable. They are used by the leading makers of trucks throughout the country.

Insist on "Whitney" Chains when making replacements.

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Hartford, Conn.

Chains, Keys and Milling Machines

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QUALITY .·. DELIVERY

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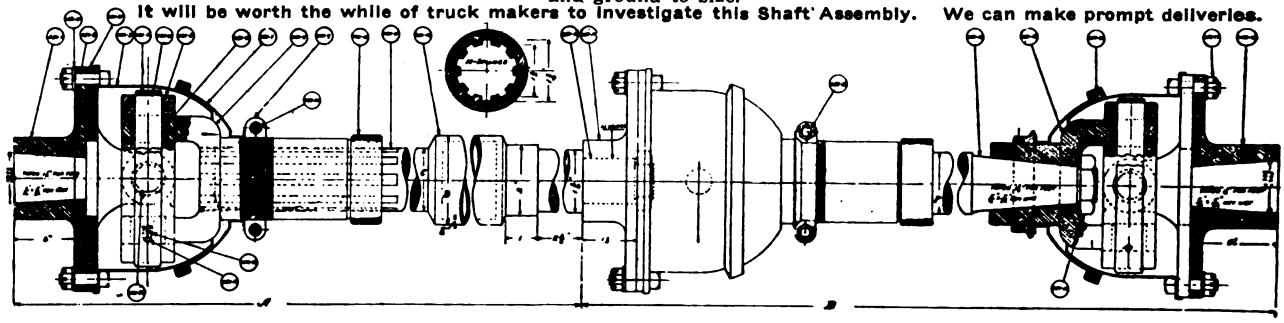
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Empire Worm Drive Axles of accepted design are built for Commercial Vehicles ranging in capacity from one to seven tons pay load.

Special **Empire Worm Drive Axles** are made also for Electric Pleasure Cars, Electric Trucks, Gasoline Fire Trucks, Armored Trucks and Industrial Trucks.

EMPIRE AXLE COMPANY

DUNKIRK, NEW YORK

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Trade Mark Reg. U. S. Pat. Off.

"NIGRUM"

Trade Mark Reg. U. S. Pat. Off.

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The builders of the best American Trucks are using "Bound Brook" and "Nigrum" Oil-Less Bushings in places where it is difficult to keep bushings properly lubricated.

These Oil-Less bushings are lubricated for life when made, and add thousands of miles to the continuous, unbroken service of trucks equipped with them.

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CULLMAN SPROCKETS

in stock and to order.





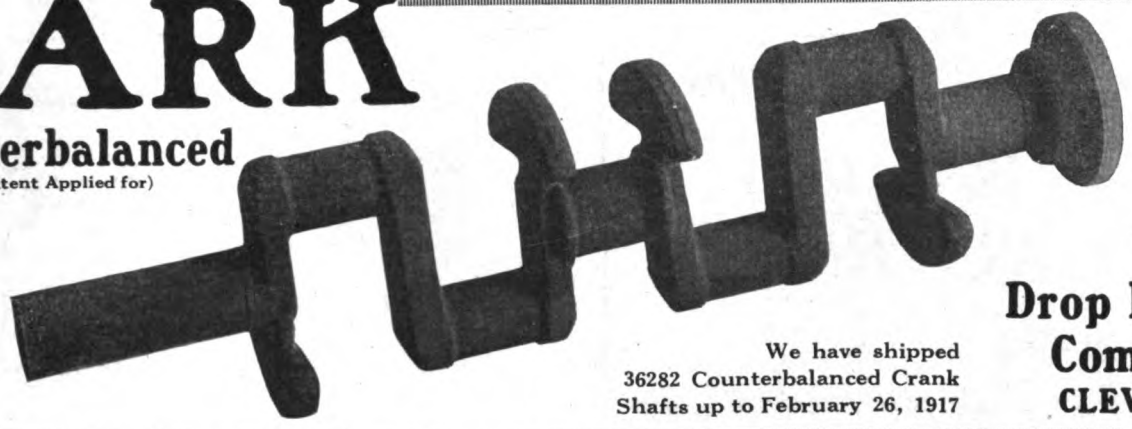
For Block, Roller and High Speed Silent Chains.
New Catalog.

Cullman Wheel Co., 1350 Altgeld St., Chicago

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PARK

Counterbalanced
(Patent Applied for)



We have shipped
36282 Counterbalanced Crank
Shafts up to February 26, 1917

The Park Drop Forge Company
CLEVELAND

Quality in Motor Trucks

It has been our endeavor to create a commercial vehicle that would excel first of all in the quality of the material used, and second, in the economy of its operation.

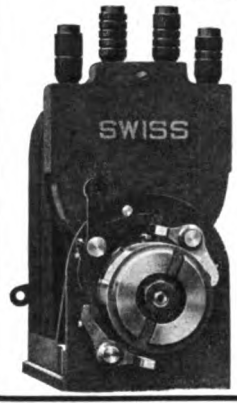
Our reputation for producing the most lasting truck is recognized by our many users.

We offer for your convenience the following sizes:

1½ ton 3½ ton
2 " 5 "
7 ton

HURLBURT MOTOR TRUCK COMPANY
133rd St. & Harlem River
NEW YORK, N. Y.

Wherever You See The Swiss Magneto



in a motor truck you will know that the manufacturer of that truck has sacrificed some of his profit in order to give the owner the best ignition known. Don't let the manufacturer of your truck increase his profits at your expense by installing cheap, unreliable ignition.

The Swiss Safety Starting Coupling Absolutely Prevents Back Kicks from Pre-Ignition. It is the only coupling with which the impulse spring cannot interfere with the proper action of the magneto. Write us for Bulletin 5 Today.

SWISS MAGNETO COMPANY
MONROE, MICH.

Strong—Sturdy—Wonderful

METZ
HIGH-DUTY ONE TON TRUCK
$695

METZ COMPANY
WALTHAM, MASS. U. S. A.

One-Ton with Three-Ton Efficiency



The MARTIN FIFTH WHEEL
makes possible this combination of a 1-ton Packard and a 3-ton Fruehauf trailer.
Write for further information
MARTIN ROCKING FIFTH WHEEL CO.
SPRINGFIELD, MASS.

DEALERS MAKE MONEY!

Get the agency for the "Tonford" truck unit—one of the quickest selling propositions you ever tackled. Attached to a Ford chassis, makes a one-ton truck. Light, strong, economical, easily handled. Drygoods merchants, furniture dealers, retailers in almost every line, bottlers, farmers, creameries, all want it. Find it best possible buy.

$325 **Tonford** $325
TRADE MARK

All the facts that sell the Ford, sell the Tonford. Highest grade truck attachment made—easiest to attach—strongest, most durable. Best constructed truck unit on market—lowest priced. Get busy now, while territory is still open. Write today. Learn how "Tonford" dealers pile up profits.

DETROIT TRUCK COMPANY, Mfgs., Detroit

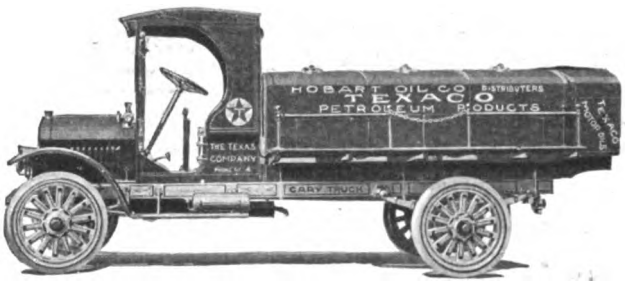
Dealers over whose doors the "CHASE" nameplate appears are building the biggest, best, and broadest business in truckdom. Details of our selling plan are ready for your inquiry.

Models from ¾ Ton to 3½ Tons.
Worm Drive Exclusively.
CHASE MOTOR TRUCK COMPANY
SYRACUSE, N. Y.



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The
Gary Motor Truck Company
Manufacturers of
Gary Worm Drive
MOTOR TRUCKS



5 MODELS 5 CAPACITIES

¾ Ton 1 Ton 1½ Ton 2 Ton 3 to 3½ Ton

Complete 1917 Catalog will be mailed Promptly on Request

General Offices:

GARY MOTOR TRUCK COMPANY
610 BROADWAY GARY, INDIANA

Electric Row Boat Motor



Make your Row Boat an Electric Launch. Buy a Jewel Detachable Row Boat Motor run by electricity. No odor or dangerous gasoline. Simple, noiseless and powerful. Attaches to any Row Boat and runs on two six volt Batteries. This is our 5th successful season.



Open Window Battery

Look inside your storage battery through the patented open window. See condition of plates and height of electrolyte. If you need a new automobile starting Battery buy a Jewel and save money. 6-60 Special $8.50.

MOTORCYCLE ELECTRIC LIGHTING SYSTEM

The Jewel Generator Motorcycle Storage Battery and complete lighting system is in great demand. Agents wanted. Write for prices and catalog P.

JEWEL ELECTRIC COMPANY, 112 N. Fifth Ave., Chicago

BOSCH MAGNETO IGNITION

Most trucks use magneto ignition, the best trucks use Bosch Magnetos.

Write for Magneto data.

Bosch Magneto Company
203 West 46th Street New York

—Sheldon Springs—

Designing a truck presents no nicer problem than that of providing it with springs.

No concern in the world is as well prepared to solve this problem—none with the amount of experience—none with the varied experience—none with the facilities and equipment, either human or mechanical, that the Sheldon Axle and Spring Co. offers.

Collectively—these facts are the reason why the service Sheldon Springs will give is a known quantity and a guaranteed quantity.

SHELDON AXLE and SPRING COMPANY
Wilkes-Barre, Pa.

Makers of Springs and Axles for Heavy Duty Service for more than 50 years.

Chicago: 122 S. Michigan Blvd. San Francisco: 444 Market St. Detroit: 1215 Woodward Ave.

In city or country, there are often bad pieces of road that must be traversed by a truck, and delays are expensive.

F-W-D Trucks with traction in every wheel are able to go over roads impossible to rear drive trucks.

Traction in every wheel means also greater efficiency on smooth, city streets, less wear on tires and general dependability.

Dealers who desire to build up a permanent business with customers who buy trucks for their investment value will be considered in open territories. To such we will gladly send details of our dealers' agreement, prices, discounts and terms. Write for illustrated catalog.

FWD Trucks

Every Wheel a Driving Wheel

FOUR WHEEL DRIVE AUTO COMPANY
Dept. K CLINTONVILLE, WISCONSIN

THOMAS TRUCKS
BUILT IN NEW YORK

The Thomas is keyed to do things a little better than the best—it has a mission beyond the ordinary. What you know about other trucks is no guide as to what your customers can expect from the Thomas.

The Two Ton Worm Drive

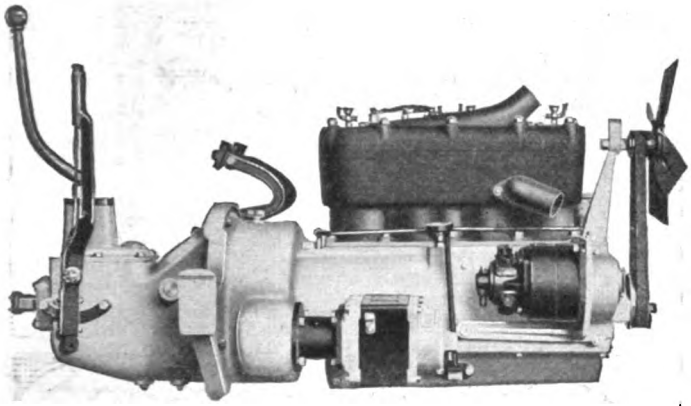
YEARS AHEAD

Dealers—write for specifications and open territory

THOMAS AUTO TRUCK CO., Inc.
Factory and General Offices
639 W. 51st Street, New York City

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G·B&S motors



Four Cyls. 3¾ x 4¼—22½ H.P. Three Bearings.

New Chain Adjustment

By a very simple but absolutely certain method the chains on the G B & S motor may quickly be taken up. This one feature indicates the continuous process of refinement that is possible in a factory which devotes its energies exclusively to the production or one type and one size of motor.

This motor has the power, the stamina and the quality that makes it supremely satisfactory in motor truck service. Write.

GOLDEN, BELKNAP & SWARTZ COMPANY
DETROIT, MICHIGAN

"Velvet Mileage"
from



GOODRICH DE LUXE TRUCK TIRES

To avoid excessive vibration truck users sometimes discard ordinary tires after they have worn down about one inch.

Goodrich **De Luxe** tires contain nearly twice as much rubber which must be worn down before they reach that point.

That's why users say they deliver "Velvet Mileage."

The B. F. Goodrich Co., Akron, Ohio

Truck Service Manager Wanted
for Chicago

Must be competent to handle big proposition, thorough mechanic, one who can qualify with best of references, stating past experience. Permanent position and good salary for the right man. Apply with references. Box A-56.

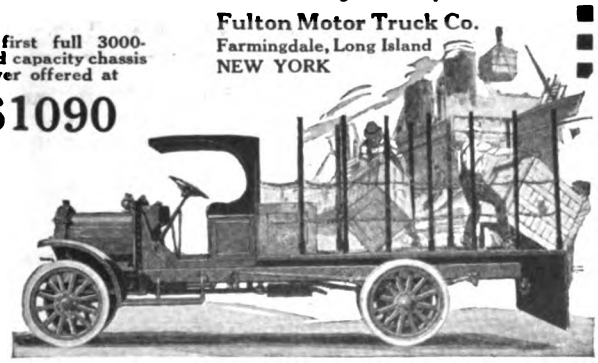
THE FULTON TRUCK

Dealers—*Write for territory still open*

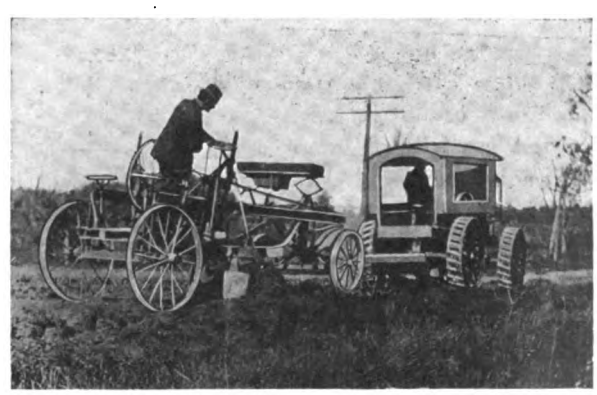
The first full 3000-pound capacity chassis ever offered at

$1090

Fulton Motor Truck Co.
Farmingdale, Long Island
NEW YORK



Lenox "American" Tractor



The "American" doing practical road work

SPECIAL ADVANTAGES

4-wheel drive, 4-wheel steer, light weight, extreme flexibility and unusual amount of horsepower actually delivered at the drawbar.

Catalogue and prices on request.

Manufactured by

LENOX MOTOR CAR COMPANY
BOSTON, MASS.

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REO



Two Reo Trucks
One Reo Quality

THAT SAME QUALITY that has made Reos known the world over as "the Gold Standard of Values."

THE SAME ENGINEERING — same "50 per cent oversize" in all vital parts—same care in making.

IS IT ANY WONDER that the best dealers are most desirous of handling the Reo line?

A REAL GUARANTEE back of your promise to the buyer.

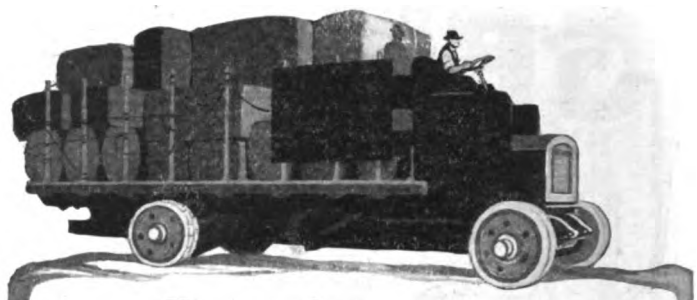
THOSE ARE the factors that make it pleasurable as well as profitable to sell Reos.

Reo Motor Car Company
Lansing, Mich.



prices are f. o. b. Lansing, Michigan, subject to increase without notice

"THE GOLD STANDARD OF VALUES"



Power!

Power at low speed—power enough and to spare—that's what counts in a heavy truck. When the motor turns slowly, the compression is maximum, the mixture often too dense for an ordinary spark to penetrate. The

EISEMANN MAGNETO

is standard equipment on 72 different makes of trucks, largely because the manufacturers' tests have shown that the incensely hot, powerful Eisemann spark penetrates the densest compression even when the motor is barely turning over!

In all, 117 manufacturers have adopted the Eisemann Magneto as standard equipment. They know its dependability, its durability its power.



The Eisemann Magneto Co.
Sales and General Offices
32-33d St., Brooklyn, N. Y.
Detroit, Mich., 802 Woodward Avenue

AGENTS WANTED



"Little Giant" in the service of the **Inland Steel Company**

Owing to territorial adjustments we now have several money making territories open to live agents. If you want to connect with a progressive motor truck manufacturer who backs his guarantee with $12,000,000.00 capital, who has had twenty-five years manufacturing experience and who has 25,000 satisfied customers in the United States

Here is Your Opportunity.

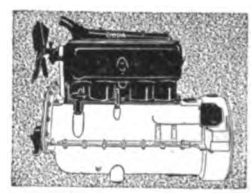
The "Little Giant" Line Includes

Little Giant Convert-a-Car.
(Converts any Ford into a one ton truck)
Model 15—1 Ton Worm Drive
Model 16—2 Ton Worm Drive
Model 17—3½ Ton Worm Drive

SPECIAL BODIES FOR EVERY PURPOSE

Write for Prices, Specifications and Terms

CHICAGO PNEUMATIC TOOL CO.
615 Little Giant Building CHICAGO
Branches and Service Stations Everywhere



REPUTATION: It is one thing to have a reputation and sometimes quite another and a very different thing to deserve one. **ESTABLISHED,** and therefore deserved, is the high repute of the Buda Motor. It is based on reliable, long-lived, economical, efficient performance, the result of 36 years of the highest grade of manufacturing.

The BUDA MOTOR

is an expression of our one ideal — Quality; and this is attained through conservative engineering plus conscientious workmanship and the fact that —

OUR CAPACITY, though large, has grown solely on the basis of the number of motors we could produce carefully, test thoroughly, guarantee positively. It is kept squarely on that basis. When a BUDA MOTOR goes into your assembly our reputation goes with it. We cannot afford to forget that, and — *neither can you.*

THE BUDA COMPANY, HARVEY, (Chicago Suburb) ILL.

THE BUDA COMPANY BUDA MOTOR ESTABLISHED 1890

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Thermoid
HYDRAULIC COMPRESSED Brake Lining—100%

An Overturned Truck

reflects discredit on both owner and maker. However the accident may have happened, many people say: "Careless driver," or "Irresponsible owner," or "Unreliable maker."

Thermoid Brake Lining won't prevent all kinds of accidents, but it most positively will prevent all those that come from slipping brakes—brakes that fail through their lining. Here is a big source of costly accidents eliminated at trifling expense.

Thermoid will grip with friction power even when worn thin as paper. It is one single solid mass, made so by hydraulic compression. By weight it shows 50% more material than any other brake lining. That material is long-fibre Canadian asbestos spun on brass wire and impregnated with a friction compound which is also impervious to heat, water, oil, gasoline or dirt.



Cannot be burned out nor affected by oil, heat, water gasoline, dirt.

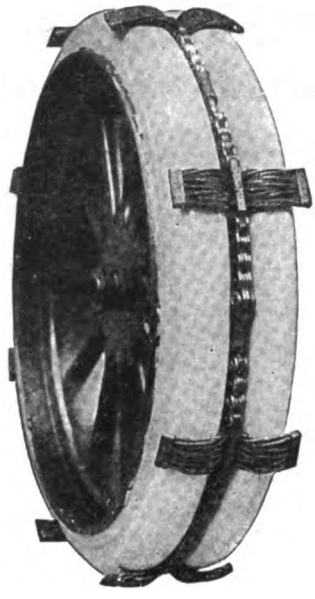
Your Guarantee

Thermoid Brake Lining is absolutely guaranteed to give more satisfactory results and to outwear any other lining manufactured. Not affected by heat, oil, water, gasoline or dirt.

Thermoid Rubber Company

Trenton, New Jersey

Makers of a full line of automobile accessories and mechanical rubber goods.



Don't Wait

until the streets are covered with ice and snow, before getting "NEVER-SKIDS" for your motor trucks.

THE NEW TYPE

NEVER-SKID

practically eliminates vibration

Does away with skidding and affords positive traction on slippery streets. The cross-pieces are made of the finest quality woven steel wire — **strong** enough for the heaviest machines made.

The device can be applied in a few minutes without jacking up the truck, and there is no danger of its catching in driving chains or damaging tires.

YOU WILL SURELY NEED "NEVER-SKIDS" this winter.
Why not get them now?
Folder and prices will be gladly sent

NEVER-SKID MFG. CO.

122 Liberty Street, New York, N. Y.

New England Distributer: WILLARD B. DAVIS, 30 Danforth Street, Fall River
Chicago Distributer: FRED ALLEN AUTO SUPPLY CO., 1610 S. Michigan Avenue

STEGEMAN 6 (SIX CYLINDER) TRUCKS

For Heavy Duty Service

The Stegeman has stood the severest strain and stress of heavy duty service. McDonald of Red Rock, Arizona, hauling ore and freight, says: "I have grades averaging 25% and travel 100 miles each day over rough roads and get 5½ miles to each gallon of gas—hauling both ways."

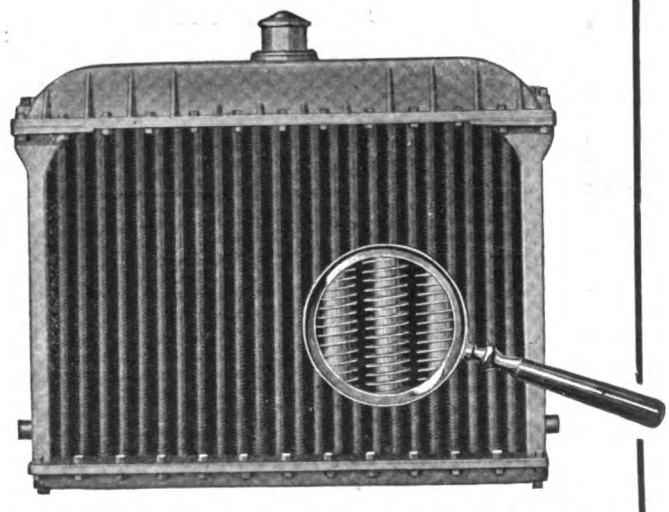
Agents Beat Competition

The Stegeman Six has lots of selling proof and evidence. It's the truck with which you can beat competition, because it possesses features buyers want—and other dealers can't supply. Write for vacant territory.



Stegeman Motor Car Co. Milwaukee

Seamless Copper Helical Tube Cooling Sections



Are Guaranteed for the Life of the Motor on Which They are Installed

Helical Tube Construction is Accepted as the Best by the Leading Truck Makers of America

Manufactured only by

ROME-TURNEY RADIATOR CO.

ROME, NEW YORK

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Real Value

THE KREBS COMMERCIAL CAR CO. CLYDE, OHIO U.S.A.

You get the full value of your money and more when you invest in a KREBS Truck.

Guaranteed by manufacturers with 16 years' experience in motor vehicle construction, the KREBS combines Simplicity and Low Maintenance with Efficiency and Reliability.

It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault-type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

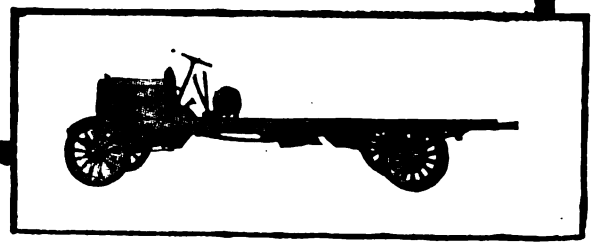
Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.

KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.

Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.



Heavy Duty Truck Frames

Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

Added capacities together with latest type equipment enable our assuring you of satisfactory service.

Our engineers are at your service, and we solicit your inquiries.

Driggs-Seabury Ordnance Co.
Sharon, Penna.

Sell *Sootless*

The *Better Plug*



SELL *Sootless Plugs*—because they're *better* Plugs.

Because their perfectly protected firing points constantly scour themselves clean.

Because their multi-wound mica insulation is far stronger than porcelain or stone.

Because their patented, exclusive construction keeps them gas-tight — oil-proof —clean.

And because *Sootless Service* paves the path for profits from your other lines.

Write for catalog and discounts today

THE OAKES & DOW COMPANY
Dept. "V", 15 Chardon St., Boston, Mass.

1000 Pound Capacity

Sheridan Commercial Car

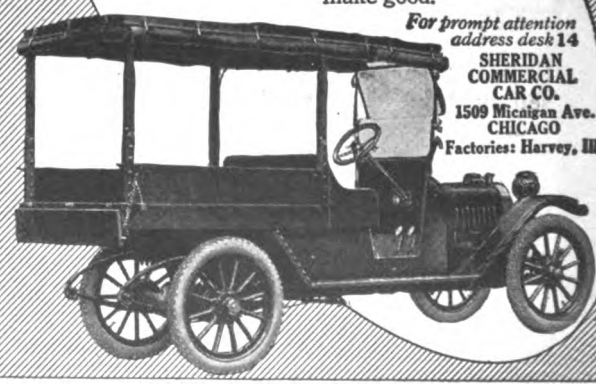
Ready for Delivery Now

Fully Equipped Price $540

THE SHERIDAN is the lowest priced delivery car on the market. Thoroughly equipped and properly built to do the work it's designed for—haul 1000 pounds any time—anywhere. Ample in size, load capacity and power.

Sells fast to a big, ready-made field of *buyers*. Not a rebuilt pleasure car. Made a truck through and through by manufacturers of trucks, to replace horses where price is what counts. Chassis alone, $490. Fully equipped, $540. Write or wire for complete details. Make territorial reservations now. Dealers make good.

For prompt attention address desk 14
SHERIDAN COMMERCIAL CAR CO.
1509 Micaigan Ave.
CHICAGO
Factories: Harvey, Ill.



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Garford

MOTOR TRUCKS

Garford Trucks range from one ton to six tons in capacity.

They are designed and built by men who have spent their lives in the study of motor trucks.

They are backed by one of the strongest organizations in the industry.

Bodies are provided to meet all requirements.

Write for catalog. Please address Dept. 103

The Garford Motor Truck Co., Lima, O.

GMC

GENERAL MOTORS COMPANY

TRUCKS

This trade mark stands for a complete line of trucks *built in worm and chain drive* to meet the varied demands of city and country work—a truck to fit your business.

Send for catalogues today

GENERAL MOTORS TRUCK COMPANY

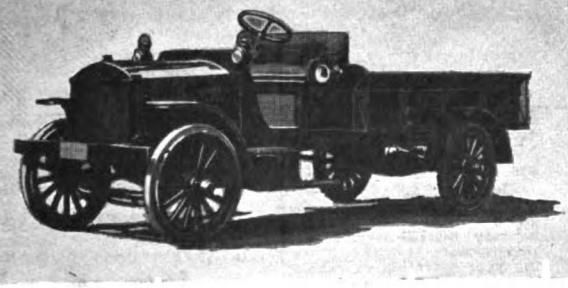
One of the Units of General Motors Co.

Pontiac, Michigan

Branches and Distributors in principal cities (84)

The GLOBE Truck

The Motor Truck PLUS



Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

Globe Motor Truck Co.

721 Wright Bldg. St. Louis, Mo.

PIERCE Governors



Guarantee Motor Truck Efficiency

Owners of motor trucks are learning from experience that the only proper way to judge any truck is to take into consideration cost of upkeep, cost of operation, and performance—three features which are vitally dependent upon the governor. A thoroughly reliable governor will eliminate 75% of the usual repairs, reduce consumption of gas and oil, and keep the truck always ready to do the owner's bidding.

One Truck on the Job Is Worth Ten in the Repair Shop

The Pierce Governor, through its automatic and perfect control of the motor, prevents the troubles that put trucks in the repair shop. Supplies just the right amount of vapor to the motor, permitting the driver to get full power at all speeds up to the danger point, and shuts off the power when that point has been reached.

Can be adjusted for any desired speed.

Used by 57 Prominent Truck Manufacturers
Demand a Pierce Governor on the truck you buy

PIERCE GOVERNOR COMPANY

World's Largest Governor Builders

ANDERSON, INDIANA, U.S.A.

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ARMLEDER Trucks



SELL ARMLEDERS—AND PROSPER WITH US

Armleder truck sales are bounding—every week sets a new record.

The flood of orders has forced us to expand our production facilities and double our output.

And every order adds substantially to the bank account of an Armleder dealer. As Armleder sales mount, Armleder dealers grow in prosperity.

A few months ago some of these dealers had never sold a truck. Now they have flourishing and substantial businesses. They are abandoning their other lines to concentrate on Armleder sales.

Join the procession; Grow with us.

Write now for the Armleder dealer's proposition.

Two-Ton Worm Drive
Three-and-a-Half-Ton

THE O. ARMLEDER COMPANY
Twelfth, Plum and Charles Streets
CINCINNATI, O.

"Get the Quality" **Booth** "Get the Quality"

IF you buy felt washers simply by the price, you can always find some that are lower priced than ours. But if you care for quality, service and perfection, BOOTH'S are the lowest priced washers made.

BOOTH FELT COMPANY, Inc.
440-450 19TH STREET BROOKLYN, N. Y.
116-118 South 5th Avenue Chicago, Ill.

DIAMOND T

TRUCKS

Diamond T Service is as thoroughly built into our ¾-ton trucks, the smallest of the line, as it is in our 3½ ton model.

Its low cost is made possible only by its wide popularity which has enabled us to produce this model in enormous quantities. There has been no cheapening of quality or inferior workmanship permitted in its design or construction.

For a thousand uses it is the most satisfactory and economical delivery vehicle ever marketed. With a body suited to your requirements, it will improve your delivery service while lessening your operation expense.

Write to-day for catalog.

Diamond T Motor Car Co., Chicago, Ill.



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CORLISS

Half-Ton Light Delivery Trucks Are Most Economical

The lowest cost of operation per ton-mile insures the greatest returns per dollar invested, from any motor truck.

The CORLISS is the most economical truck in its price class. Carefully constructed with parts you know, including Le Roi Motor, Schebler Carburetor, Dixie Magneto, etc.

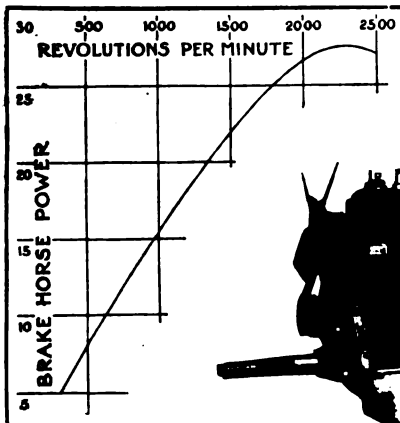
Write for catalog with complete specifications and illustrations.

Panel Body **$695**

CORLISS MOTOR TRUCK CO.
Corliss, Wisconsin

Express Body **$675**

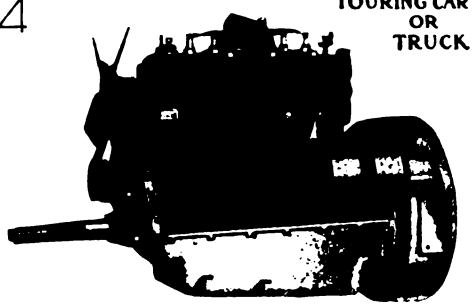




LE ROI MOTOR

3⅛×4½ MODEL C

FOR THE LIGHT ROADSTER TOURING CAR OR TRUCK



Used by leading manufacturers of best-known American-made light trucks.

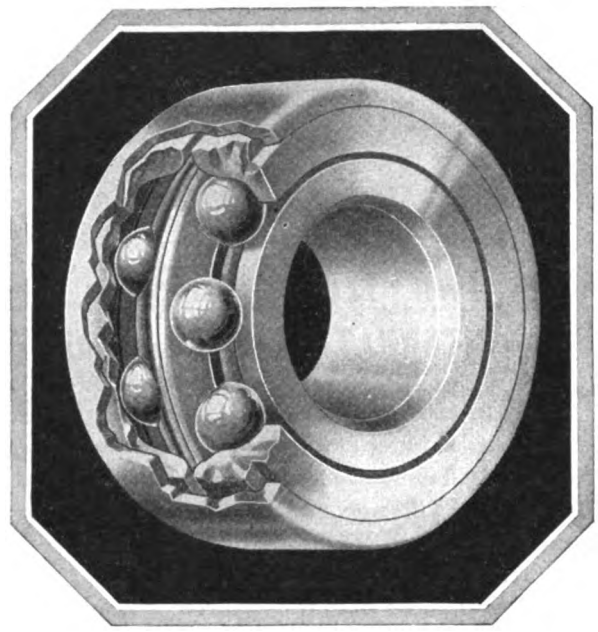
The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

CABLE LE ROI MILWAUKEE



A SUCCESS— *thanks to* QUALITY

New Departure Ball Bearings have made good in the face of the severest competition with both foreign and American makes.

This success has been due in the main to *quality*—proper steels, accuracy and endurance in-built.

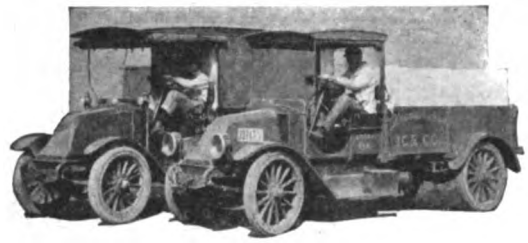
That is why New Departure Ball Bearings dominate—are in 80% of American car models—*cars of every price class.*

Whether owner, dealer or manufacturer you should know what New Departure Ball Bearings mean to the automobile. Write for the "Brown Book."

THE NEW DEPARTURE MFG. CO.
BRISTOL, CONN. DETROIT, MICH.

NEW DEPARTURE BALL BEARINGS

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Our Own Trucks Surprise Us

Some INTERNATIONAL Registrations

The **International Motor Truck** leads all other trucks in operation in Ohio, Wisconsin, Michigan, Tennessee and Oklahoma, and in the cities of Chicago and St. Louis. In Michigan, for instance, the home of the motor truck, the **International** leads with 324 trucks, as compared with 259 for the nearest competitor. Further than in these states and cities, the registration has not appeared. These are new figures, sent out by the separate states, and they show **International** popularity that surprises even us.

No more compelling argument than these facts and the successful operation of these thousands of trucks could be cited. The big factor in the huge and rapidly growing sales of **International** trucks is the record of increased profits, reduced hauling costs and economical operation of **Internationals** in daily service in every line of business having loads to haul. Consider these

New Low-Price INTERNATIONALS

Model H—1500 lbs. capacity, internal gear drive (chassis)..... $1225

Model F—2000 lbs. capacity, internal gear drive (chassis)..... $1500

Prices cash f.o.b. factory.

Eighty-nine company branches and thousands of local distributors cater to the needs of **International** owners. Up-to-the-minute service is always at your hand. Write to the address below for attractive folders with all the details and full information. You owe it to the prosperity of your future to know more about the **International** motor trucks. **Now** is the best time to write.

International Harvester Company of America

(Incorporated)

88 Harvester Building Chicago U S A

BROWN-LIPE

transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

BROWN-LIPE GEAR CO.
SYRACUSE, N. Y., U. S. A.

BROWN-LIPE CHAPIN CO.

Differentials Transmissions

NEW YORK—Thos. J. Wetzel, 29 West 42d St.
SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C.

Handle Your Time Sales on the

Guaranty Time Payment Plan

GUARANTY PLAN
COMMERCIAL CAR Time Payments

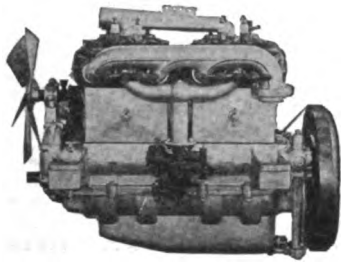
Guaranty Securities Corporation

Equitable Building, New York City

San Francisco
Hobart Building

Montreal
National Trust Company

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Beaver Motors Make Their Way By The Way They Are Made.

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications

BEAVER MFG. COMPANY

Milwaukee Wisconsin

POLACK TYRES

WAWA DAIRY FARMS

REGISTERED GUERNSEYS

CERTIFIED AND HOUSEHOLD MILK DELIVERED IN PHILADELPHIA, CAMDEN, ATLANTIC CITY, OCEAN GROVE, ASBURY PARK, OCEAN CITY AND PENNSGROVE

GEO. WOOD, PROPRIETOR
H. M. STEWART, MANAGER

WAWA, DELAWARE COUNTY, PA. March 13, 1917.

Polack Tyre and Rubber Co.,
1906 Market St., Phila., Pa.

Gentlemen:-

According to our records the left front tire removed from our 6½ ton Saurer truck March 10th ran 17,840 miles.

Yours very truly,
WAWA DAIRY FARMS.
Per T

MACK TRUCKS

MEAN

MORE SALES PER YEAR

The New MACK "heavy duty" truck has met with immediate popularity. Careful buyers have been quick to recognize its mechanical superiorities.

The following list represents two weeks' sales of this new model:

Sheffield Farms, New York
Standard Oil Co. of New Jersey, New Jersey
Emerson Morgan Coal Co., Baltimore, Md.
Independent Ice Co., Cambridge, Mass.
Geo. Gunther Brewing Co., Baltimore, Md.
Borough Asphalt Co., Brooklyn, N. Y.
W. B. Johnson, Seymour, Conn.
Michigan Steel Casting Co., Detroit, Mich.
Edelstein Contracting Co., New York
Burns Brothers, New York
The Texas Company, Chicago, Ill.

Write for Dealer Helps

INTERNATIONAL MOTOR COMPANY

64th St. and West End Ave.
NEW YORK



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AUTOCARS
are equipped with the
"JASCO" TANK

Why? Because demonstrated service facts have proven that this gasoline receptacle makes fuel absolutely safe from fire or explosion and devotes every drop to energy.



"JASCO" TANKS are made of drawn steel. They are seamless, tinned and tested and positively cannot spring a leak even under the most severe conditions. They are money savers, life and property protectors. If your car is equipped with an old fashioned riveted tank you are courting danger. Investigate the "JASCO" today. Full details on request.

The "Jasco" Tank is used and indorsed by the following prominent manufacturers:

PLEASURE CARS

Biddle Motor Car Company, Simplex Automobile Company, Mercer Automobile Company, Lozier Motor Company, Stanley Motor Cariage Company, James Cunningham Son & Company, H. H. Franklin Mfg. Company.

TRUCKS

Baldwin Locomotive Works, Autocar Company, General Vehicle Company, H. G. Burford Company, Peerless Motor Car Company, Garford Motor Truck Company, Gramm Motor Truck Company, Thomas Auto Truck Company, Motor Trucks, Ltd., Canada.

JANNEY, STEINMETZ & CO.

Main Office: PHILADELPHIA

New York Office: HUDSON TERMINAL BUILDING

NORTH AMERICAN MOTORS

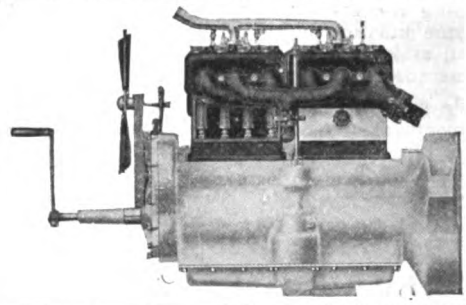
This is to announce two new models which have been added to the "N. A." line. They are: Model C, developing 20-25 H.P., and Model CX, developing 25-30 H.P.

These motors round out a line of power plants for commercial vehicles which are the most thoroughly accessible and simplest truck motors ever designed.

Full information on these new models or on our entire line will be gladly sent.

A Detroit office has been opened at 1325 Dime Savings Bank Building.

NORTH AMERICAN MOTORS COMPANY
Factory: POTTSTOWN, PA.
Detroit Office: 1325 Dime Savings Bank Bldg.





WICHITA TRUCKS
Dependability Plus Service

We want a Dealer with energy and spirit,—we want one who will make the co-operation with him of our factory organization worth our while, and his. We want men who can interest concerns in our heavy-duty trucks and then not let up until they sell them.

If you are such a Dealer we have an interesting selling proposition that will interest you immensely.

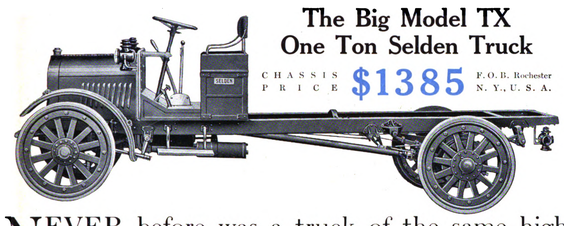
Besides the WICHITA 3½-ton capacity truck, we have a 2½-ton and a 5-ton truck—both worm driven.

Write us for our plans.

WICHITA FALLS MOTOR COMPANY
Arthur Boulevard, Wichita Falls, Texas

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Selden Trucks



The Big Model TX
One Ton Selden Truck

CHASSIS PRICE **$1385** F. O. B. Rochester N. Y., U. S. A.

NEVER before was a truck of the same high quality offered at so low a price. Think of it—a big, powerful Selden "IN-BUILT QUALITY" Truck—with a wheelbase of 140 inches and a frame of 9 feet 6 inches back of the driver's seat—for $1385. Standard construction throughout—made from the best materials obtainable.

And this is but one of the Selden Complete Line of sturdy ¾ Ton, 1 Ton, 2 Ton, 3½ Ton and 5 Ton Worm Drive and Internal Gear Drive Models. There's a Selden Truck for every commercial purpose.

Some day—not very far off—Selden territory will all be closed. Some day soon we shall have to refuse many a good dealer the privilege of representing us in his field. Applications for territory are coming in fast from all sections of the country. Before long we will have all the live, hustling, dependable dealers we need. Why wait until then, when it will be too late? If you want to build up a profitable truck business, get a Selden Agency *quick!*

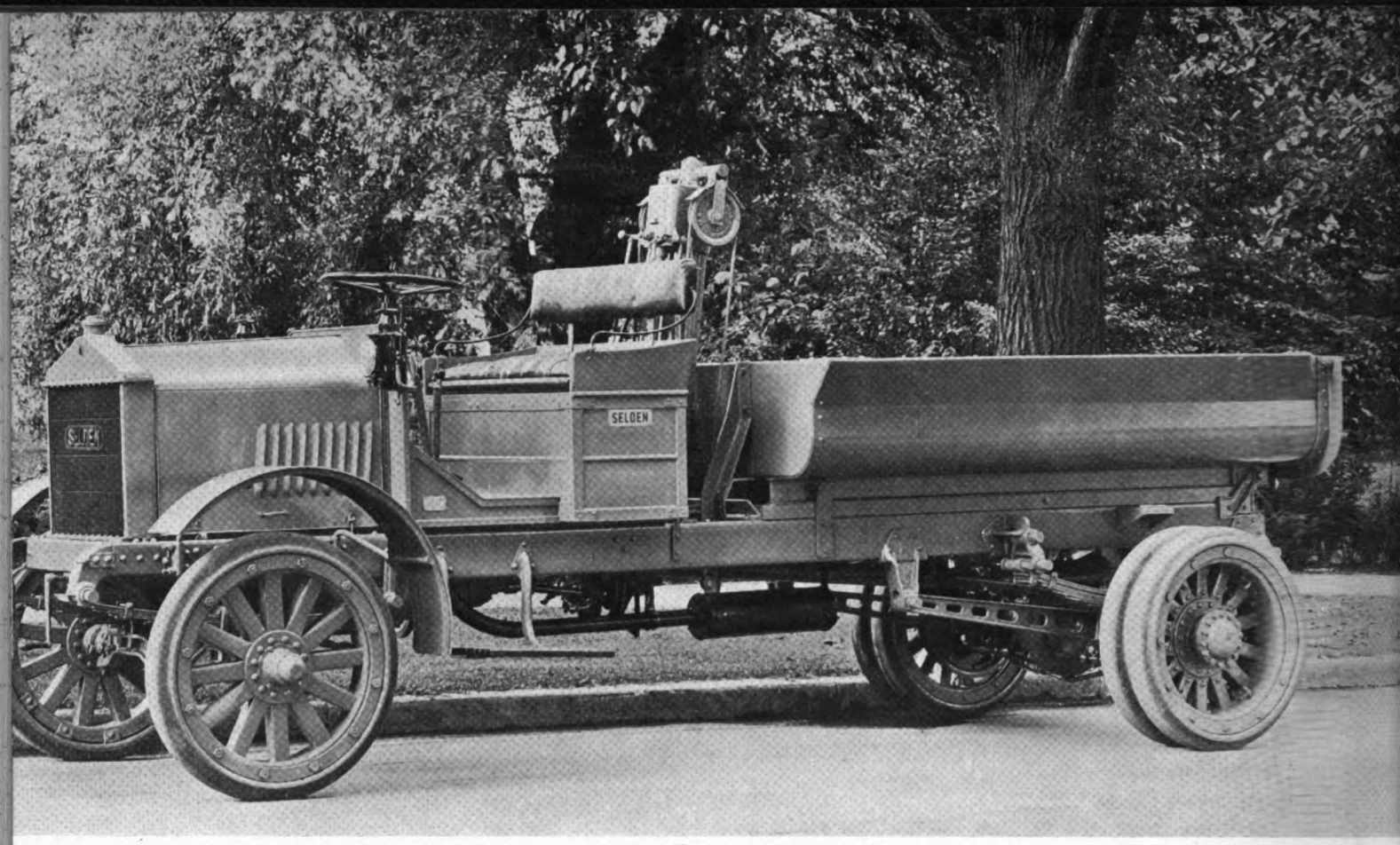
Dealers!

Clip the Coupon—mail it to us with your letter head—and we will make you a proposition that is *different* and *more liberal* than any you have ever had offered to you before.

Selden Truck Sales Co., Rochester, N. Y., U. S. A.
Gentlemen: Please explain your New Dealer Sales Plan.
Name
Business
Address

Selden Truck Sales Co.
Rochester, N. Y., U. S. A.

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The Selden Complete Line

SELDEN TRUCKS · SELDEN · IN-BUILT QUALITY

of Light Delivery and Heavy Duty Motor Trucks

Light Delivery Worm Drive
1 Ton Worm Drive
1 Ton Internal Gear Drive
2 Ton Worm Drive
2 Ton Internal Gear Drive
3½ Ton Worm Drive
5 Ton Worm Drive



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MACCAR

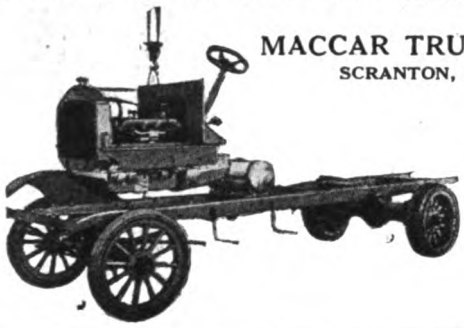
Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.

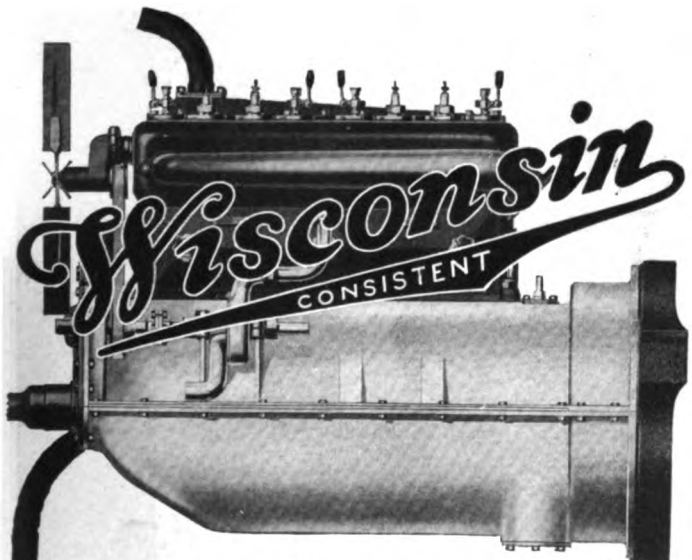
If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.

The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.

Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.



MACCAR TRUCK CO.
SCRANTON, PA.



Thinking About Trucks?

If you are, you're thinking about motors—wondering which one will stand up best under the tests your work will put it to. Men who know motors will tell you there's dependable quality in Wisconsin Consistent Motors that keeps them on the job, working at full efficiency.

Motors for pleasure cars, trucks and tractors. Write for specifications.

Wisconsin Motor Mfg. Co.

Sta. A-Dept. 319 Milwaukee, Wis.

New York Branch: 21 Park Row, T. M. Fenner, Factory Representative.
Pacific Coast Distributors: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles Co., Los Angeles, Cal.

THE MARK OF A BETTER RADIATOR

G & O Radiators for Heavy Duty Service

The G & O Mfg. Co.
New Haven Connecticut

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DUPLEX

THE ORIGINAL 4 WHEEL DRIVE

Do you want a heavy hauler that will climb an icy embankment, or pull through sand and mud up to the axles, with a 3½-ton load.

Do you want a heavy duty truck that will go and keep going where no rear-drive truck can follow? That can't be stuck as long as any one of its four wheels can find traction? That will haul two or more trailers?

Send for your copy of the new 1917 Duplex catalog. It tells why the Duplex meets your requirements. It explains in detail why the even Duplex application of power to all four wheels keeps down the fuel consumption, saves tires, and cuts repair bills to the minimum.

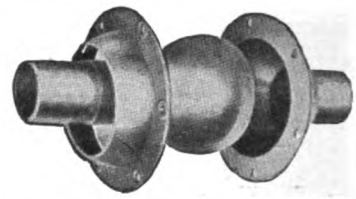
$1,000,000 was raised in 48 hours recently to build new plants to make more Duplexes to answer the demand from contractors, oil men, the U. S. government, mining, construction, and engineering companies. Our production has been tripled in the last two months; and will be doubled again upon the completion of new plants.

DUPLEX TRUCK COMPANY
LANSING MICHIGAN



Duplex hauling its own load and trailers on snowbound wagon trail over badly cut sand loam near Denver, at altitude of 5,000 feet

BOSSERT

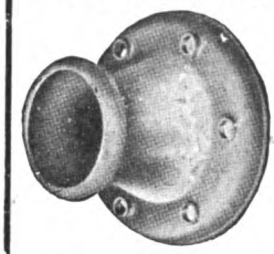


In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice.

We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

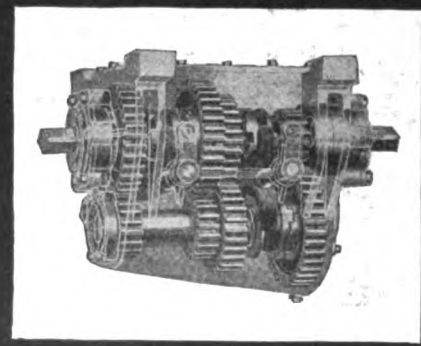
"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



The Bossert Co.
UTICA
N. Y.

COTTA TRANSMISSIONS



All Gears Always in Mesh

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

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SERVICE

"The Steering Gears that Predominate on Motor Trucks"

Enormous bearing surfaces, highest quality materials and careful workmanship guarantee the safety, reliability and easy operation of

ROSS GEARS

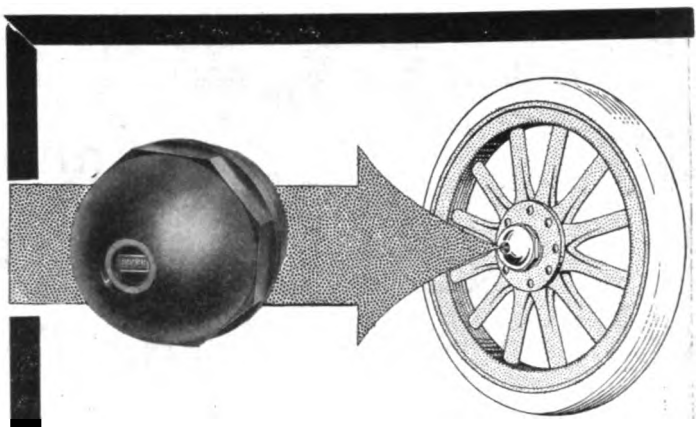
Our fire-proof, day-light plant, modern, specially designed machinery, and unequaled facilities for securing raw materials, are assurance of SERVICE in deliveries.

On quality and service, Ross Gears are now in use on 124 different makes of motor trucks.

Write for catalog

ROSS GEAR & TOOL CO.
750 Heath Street Lafayette, Ind.





Are you wasting gasolene?

Are you getting full mileage out of your tires? Are your drivers efficient?

There is one way to find out—keep accurate mileage records with the

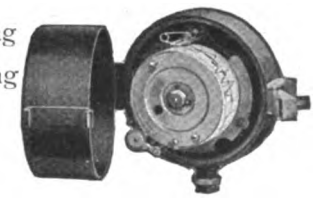
DREADNAUGHT *Indestructible* Hub Odometer

The Dreadnaught gives accurate, continuous mileage records—points out delivery leaks and enables you to run your trucks at top efficiency. Easy to read—dust-proof, grease-proof and figures are always right-side up. It's the only hub odometer guaranteed indestructible—a new one free if you break it, no matter how.

RECORDOGRAF

gives you an accurate tape-record of your car during every minute of the day. It shows:

(1) Time truck is standing
(2) Time truck is moving
(3) Distance covered
(4) Speed at all times



Write for booklet and prices.

AMERICAN TAXIMETER COMPANY
Mfrs. of Jones and Popp Taximeters
Broadway at 57th Street New York City

Service Stations in the Following Cities
San Francisco New Orleans Washington Chicago Detroit Philadelphia Seattle Boston Pittsburgh St. Louis

Standard

MADE IN DETROIT USA

Motor Trucks

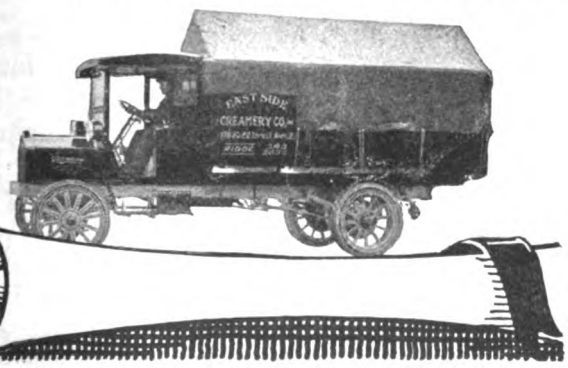
Startled the Motor Truck Industry By a Unique Sales Plan

First of all, the Standard is an unusual truck. It is a powerful combination of many of the best-known units manufactured — parts that are considered the standard the world over.

The Standard Motor Truck is sold in an unusual way. Costs you nothing to learn of the Standard Selling Plan. It is the most liberal ever made.

Write for details of this plan. No obligation.

Standard Motor Truck Co. 315-327 Bellevue Ave. Detroit, Mich.



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Announcing

INDIAN TIRES

for TRUCKS

The Guarantee	The guarantee that accompanies an Indian Tire of course covers as great a distance as that of any other tire made. But we do not expect to sell Indian Tires merely on the big mileage shown in the guarantee.
The Big Mileage	The big mileage is built into the Indian Tire by men who have proved their ability by building, for others, some of the farthest traveling heavy duty tires made.
Long Experience	Long experience, with leading makers of truck tires, has equipped the designers and builders of the Indian Tire with the knowledge and skill necessary for building tires of the highest possible character.
Extremely High Quality	The extremely high quality of the Indian Tire will soon be a matter of common knowledge. It is of a character to command attention—to win respect and confidence.

INDIAN TIRE & RUBBER COMPANY

New Brunswick New Jersey

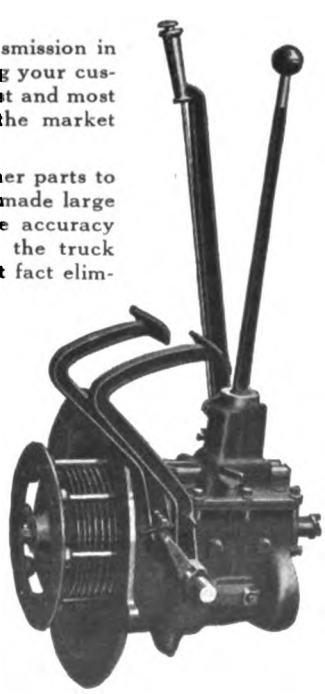
FULLER

Unit Power TRANSMISSIONS

By using FULLER transmission in your truck, you are giving your customers the finest, strongest and most trouble proof unit that the market affords.

No bearings or any other parts to adjust. These parts are made large enuf to maintain absolute accuracy during the entire life of the truck without adjustment. That fact eliminates a chance for anybody to get out of order, any part, thereby causing your truck to operate improperly. Isn't this vital?

Look for the name FULLER.



Eastern Representatives
EARLE & BOGGS
1790 Broadway, N. Y. C.

FULLER & SONS MFG. CO.
Kalamazoo, Mich.

We Make It Easier For You to Sell the Easiest Selling Trucks

GRAMM BERNSTEIN

TRUCKS

WE advertise *your* business in *your* own local papers over *your* name at *our expense.*

We send an expert truck salesman whenever or wherever you need him to help you close a sale—at *our expense.*

The Gramm-Bernstein line includes trucks for every prospect's needs—1, 1½, 2, 2½, 3½, 5 and 6 ton trucks. Write for all particulars of our most liberal "Help-the-Dealer" sales policy.

Gramm-Bernstein Motor Truck Co.
13 Gramm Blvd., Lima, Ohio

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LAMSON TRUCKS

5 POPULAR SIZES

Ready for Prompt Deliveries



LAMSON 2½-Ton Truck

SPECIFICATIONS

Motor—Wisconsin, 4 cylinder, long stroke.
Springs—Semi-elliptic. Steering Gear—Ross.
Axles—Sheldon. Tires—Optional.
Clutch—Borg & Beck. Transmission—Cotta.
Carbureter—Stromberg.
Gas Supply—Seamless steel tank with Stewart Vacuum System.
Ignition—Dual—Bosch Magneto and Atwater Kent Unisparker.
Governor—Duplex. Electric Lights—Vesta System.

Correspondence Solicited with Live Dealers and Distributers

Lamson Truck & Tractor Co.
4644 W. Madison Street, Chicago

LAMSON Trucks are actually manufactured in all sizes advertised, and in sufficient quantities to meet with prompt and satisfactory delivery all orders from dealers, fleet owners or individual users.

Every business requirement from light delivery to heavy hauling is covered by a LAMSON model. The field for sales is unlimited.

1-Ton—1½-Ton—2½-Ton—3½-Ton—5-Ton Capacities



Chassis of a LAMSON 5-Ton Truck

LONG

AS CONSTANT AS NIAGARA

for

MOTOR CARS MOTOR TRUCKS AND TRACTORS



Long Cooling Systems perform a greater service and give greater assurance of perfect radiation than you can reasonably expect of the common radiator. Each Long Cooling System for each motor is designed to order. Each step in creating the design is taken in co-operation with the Engineering Departments of our factory and those of the manufacturer. Proper design insures proper construction. By reason of this co-operation, we attain minimum cost and maximum efficiency.

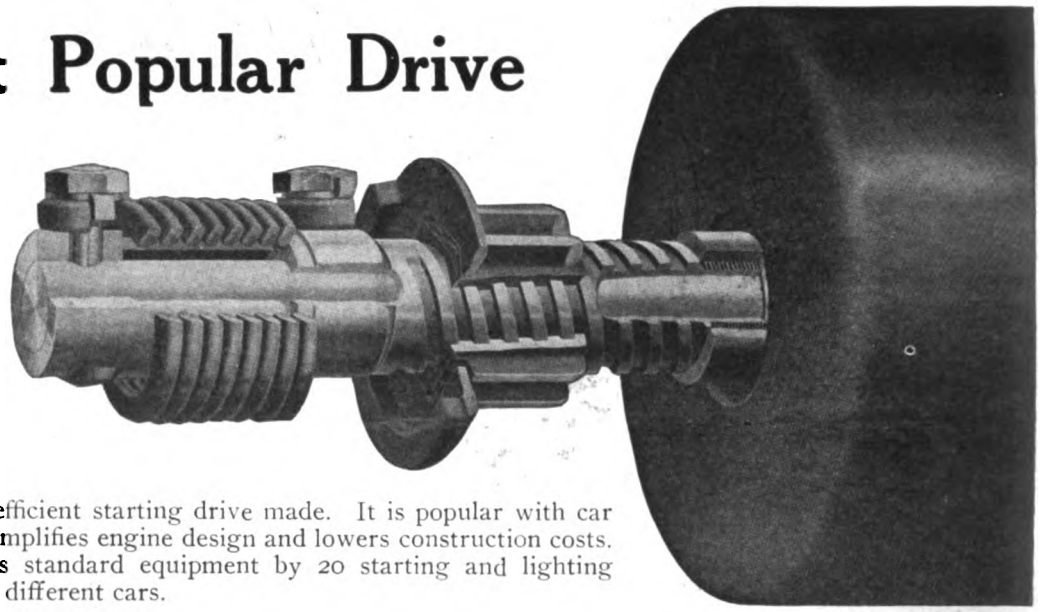
LONG MFG. CO.
DETROIT, MICH.

Pioneer Makers of Gasoline Engine Cooling Systems

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The Most Popular Drive

ECLIPSE-BENDIX DRIVE



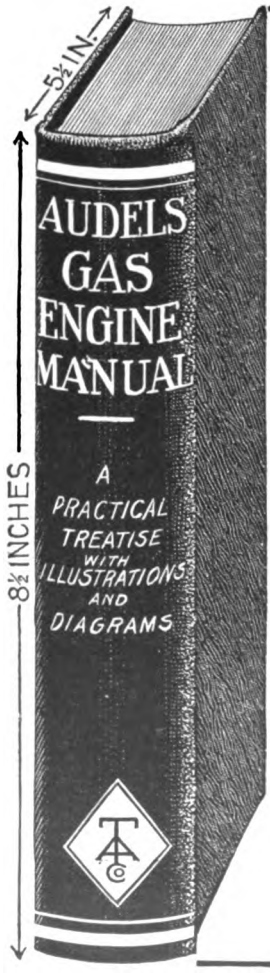
is the simplest and most efficient starting drive made. It is popular with car manufacturers because it simplifies engine design and lowers construction costs. It is regularly supplied as standard equipment by 20 starting and lighting systems and is used on 150 different cars.

The chief features of the Eclipse-Bendix Drive are, first, the direct gear starting drive it gives, by means of teeth cut in the flywheel—secondly, the automatic meshing and demeshing gear, which is drawn into mesh when the motor starts and is disengaged as soon as the engine is running faster than the starting motor—thirdly, the spring drive, securing a flexible drive and preventing back firing and stripped gears. This is shown in the illustration. The sleeve with the worm carrying the gear is driven by the internal shaft through the spring, giving the utmost flexibility.

Trucks on which the Eclipse-Bendix Drive can be obtained:

Collier	International	Standard
Denmo	Kelly-Springfield	Stegeman
Dorris	Lippard-Stewart	Sterling
Federal	Little Giant	Stewart
G. M.	Republic	U. S.
Gramm-Bernstein	Rush	
G. V. Truck	Service	

ECLIPSE MACHINE COMPANY **ELMIRA, N. Y.**



Audel's Gas Engine Manual

This volume gives the most valuable information respecting the construction, care and management of **Gas, Gasoline and Oil Engines, Marine Motors and Automobile Engines,** including chapters on **Producer Gas Plants** and the **Alcohol Motor.**

The work is divided into 27 chapters. Each chapter is illustrated by diagrams which make it a thoroughly helpful volume, containing 512 pages, 156 drawings, printed in large, clear type on fine paper, handsomely bound in rich red cloth, with gold top and title, measuring 5½ x 8½ inches, and weighing over two pounds.

The book is a practical educator from cover to cover and is worth many times the price to any one using a gas engine of any type or size.

Price - - - - $2.00 Postpaid

Book Department The Commercial Vehicle

239 West 39th Street, New York

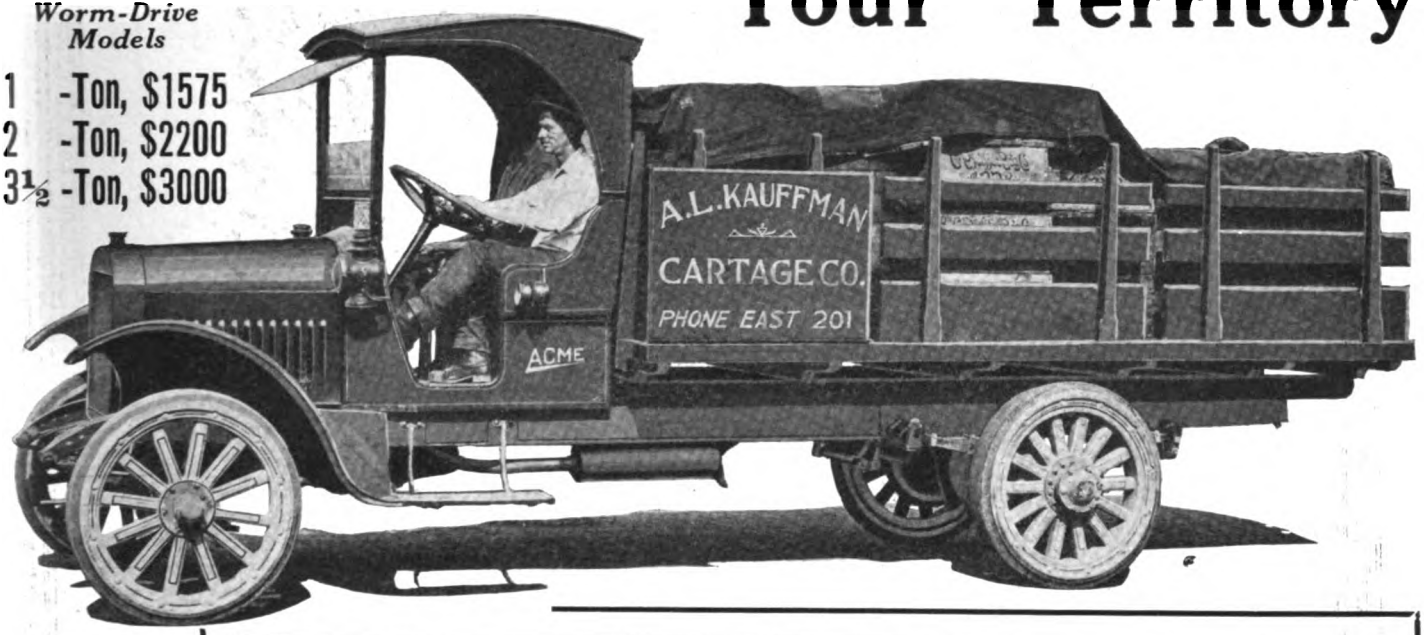
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ACME

Bigger-Business Plan May Yet Be Open in Your Territory

Three Acme Worm-Drive Models

1 -Ton, $1575
2 -Ton, $2200
3½ -Ton, $3000



ACME
THE TRUCK OF PROVED UNITS

Wire or Write to Know!

Act immediately to know if **you** can seize this great opportunity to increase your truck sales and profits. Keen dealers who already have grasped our money-making offer, now are making tremendous gains in business. This is no ordinary agency proposition. Let us give you specific facts and figures. Send for them today.

Continental Motor

Timken Axles and Bearings

Timken Worm--Drive

And all other units of equal high grade.

Acme Trucks Are Sure Sales-Makers

The big, powerful Acme Trucks are the trucks your "prospects" **know,** for Acme proved units, such as Continental Motor—Timken Axles, Bearings and Worm-Drive, etc., are acknowledged to be supreme units of truck construction. Your prospects can actually **see the service** in the Acme. The Acme practically sells itself.

Rush your request for our special plan. We **concentrate our advertising in your local papers!** That is only one feature of Acme co-operation. Here is the way to bigger, faster sales—bigger, quicker profits. Send the coupon today.

Cadillac Auto Truck Co.
13 Mitchell Street, Cadillac, Michigan

Rush This Coupon for Plan Details

Cadillac Auto Truck Co.,
13 Mitchell St., Cadillac, Mich.

Please send your book, "A Pointer To Profits," illustrating and describing ACME Trucks and their proved units; also, furnish performance facts secured from owners showing gas economy, low upkeep, etc. Interested in..... ton capacity. Now using.....

Name .....

Address .....

Business .....

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The Confidence of a Nation

The confidence of a nation is not lightly entrusted nor long retained without due reason. Its bestowal is an award of merit; its secure possession is the honor of honors. This is the grand prize awarded the Continental Motor—the lasting confidence of the American people.

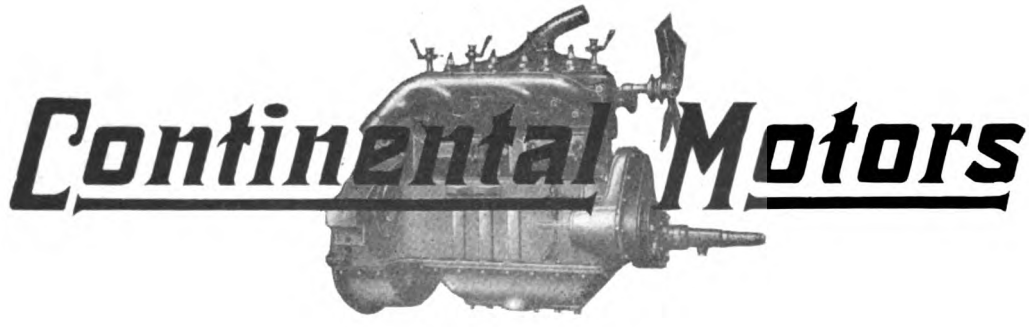
Year by year more manufacturers of cars and trucks use the Continental Motor. Year by year their motor vehicles find favor with an increasing section of the public. The number of manufacturers has grown from tens and twenties to more than one hundred and fifty. The number of Continental owners has increased from thousands and tens of thousands to hundreds of thousands. This twofold confidence—of the industry and of the public—amply justifies Continental's high title of America's Standard Motor.

CONTINENTAL MOTORS CORPORATION

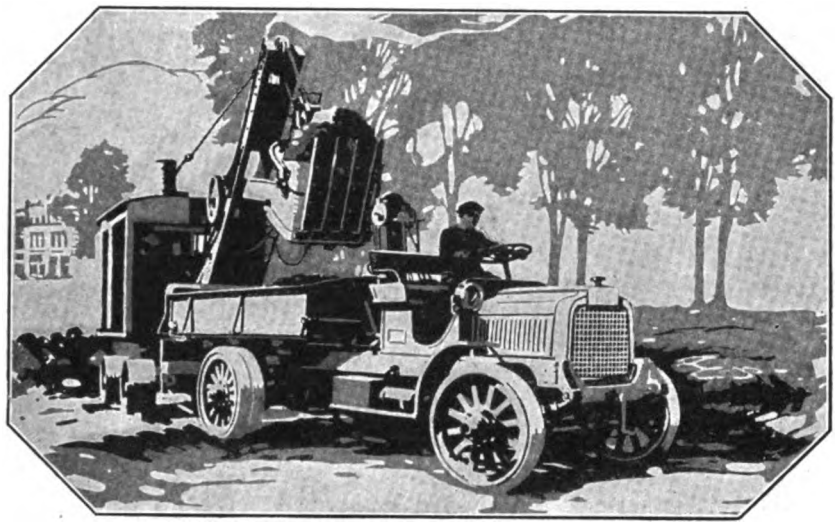
OFFICES: Detroit, Michigan

FACTORIES: Detroit—Muskegon

Largest exclusive motor manufacturers in the world



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Eight Years of Truck Success

U. S. Motor Trucks have been built, sold and successfully operated for eight years.

More U. S. trucks are bought to-day than ever before in the history of the business. The last six months' demand has increased the production 300 per cent.

It's coming fast. Each month adds to the evidence that buyers want and insist upon U. S. trucks.

Over 50 per cent of the men and businesses who have bought one U. S. truck have later bought additional U. S. trucks. Many have added truck after truck until great fleets are in operation in many parts of the world.

Here is proof of success, evidence of stability, assurance of satisfaction for present purchasers of U. S. trucks.

The United States Motor Truck Company is a strong business organization, directed by men who have been successfully engaged in similar businesses for 30 years.

The Floating Power Plant—an exclusive U. S. feature—economizes power and increases the life of U. S. trucks.

Worm Drive 2½, 3½ and 5 ton. Chain Drive 2½ and 3½ ton.

Many U. S. truck dealers are selling trucks at the rate of 100 or more a year, some as many as 300 a year. We have some excellent territories available just now. If you are thinking of making a connection, write us about your plans. Perhaps we can help you.

The United States Motor Truck Co.

CINCINNATI, OHIO

U S
FLOATING POWER PLANT
MOTOR TRUCKS

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"Built and Sold for Everlasting Service"

DAY-ELDER MOTORS CORP. D WORM DRIVE E NEWARK·N·J·U·S·A·

WORM DRIVE D E MOTOR TRUCKS

FIND THE MAN!

That Is the Mission of This Announcement—To Find the Man—THE Man—in Your City to Cash in on This Unusual Opportunity

Are YOU that man? Here's the proposition: We are building a line of Motor Trucks—D-E WORM-DRIVE Motor Trucks—that are making of lot of dealers BIG profits, QUICK profits and EASY profits.

Such a remarkable proposition deserves to be handled by a remarkable man—a SUCCESSFUL man—because the two GO TOGETHER.

We are building four remarkable motor trucks—

¾ Ton $975 1 Ton $1250 1½ Ton $1500 2 Ton $2000

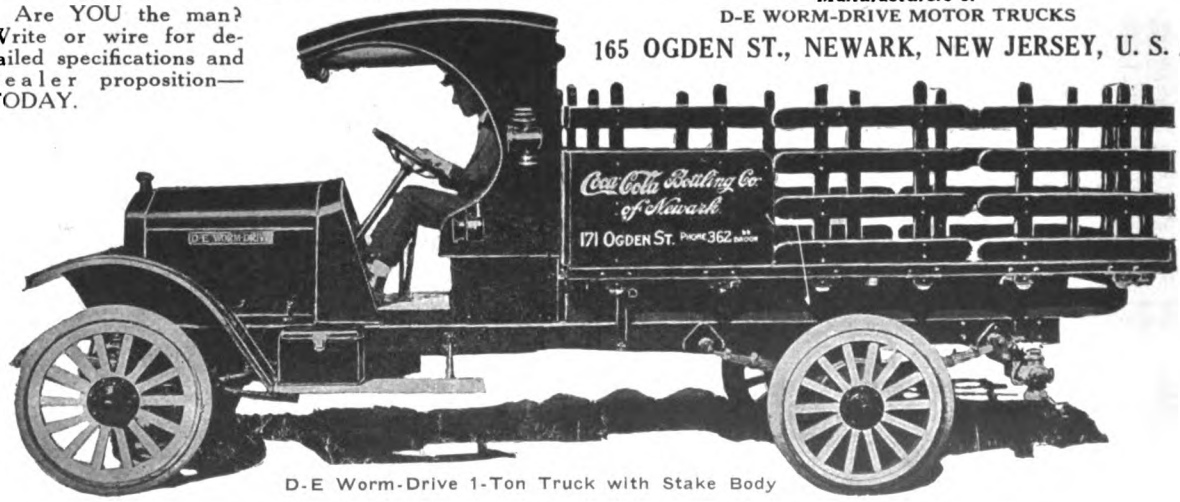
—each of which is a marvel of efficiency, and a value for the money absolutely without an equal anywhere in the United States. They are Motor Trucks with specifications that FURNISH THE ARGUMENT FOR SELLING—and CLINCH the sale—every time they are presented RIGHT.

D-E WORM-DRIVE Motor Trucks are REAL motor trucks—built to WORK and to WEAR. Their sturdy pressed steel frames, their massive WORM-DRIVE rear axles, rugged motors—and their many other outstanding features of excellence are a guarantee of this—and you will realize that in D-E WORM-DRIVE Motor Trucks you have the very best proposition going.

Are YOU the man? Write or wire for detailed specifications and dealer proposition—TODAY.

GENERAL SALES OFFICES:
1459 BROADWAY, NEW YORK
P. K. HEXTER, Sales Manager

DAY-ELDER MOTORS CORP.
Manufacturers of
D-E WORM-DRIVE MOTOR TRUCKS
165 OGDEN ST., NEWARK, NEW JERSEY, U. S. A.



D-E Worm-Drive 1-Ton Truck with Stake Body

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The Center of Three Vital Functions

Motor—transmission—axle,—three vital factors to be considered when building—or buying—a motor truck.

You insist on a motor of standard type and proven dependability—

You choose an axle which exemplifies wise mechanical construction.

The transmission—that vital center-point between motor and axle—should bear the name of a product worthy of its important relation to the other two factors.

Covert transmissions—because of their design, quality, material, and workmanship—are recognized by automobile engineers as reflecting the foremost trend of transmission construction.

The Covert engineering staff welcomes the opportunity to work with you on your transmission requirements.

The Covert Gear Company, Inc.

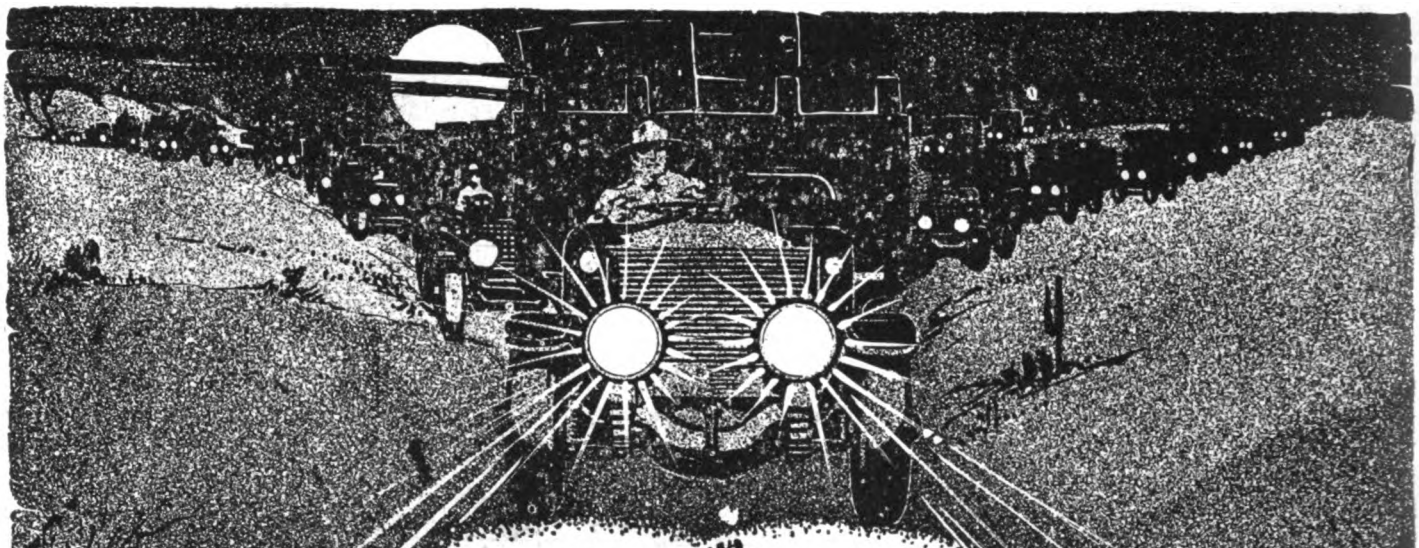
Sales and Engineering Offices, Detroit, Mich.

Factory, Lockport, N. Y.

All sales, engineering and service correspondence should be addressed to Covert Gear Company, Inc. 967 Woodward Avenue, Detroit, Michigan

COVERT

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VESTA
Lights the Trails along the Border

700 U. S. A. Trucks Equipped with Vesta Lighting System

Down on the Mexican border 700 Kelley-Springfield, Pierce-Arrow, G. M. C. and Peerless army trucks are cruising over rough, desert trails day and **night.** Every one of these 700 trucks is equipped with the Vesta Generator Lighting System,—convincing evidence of Vesta superiority.

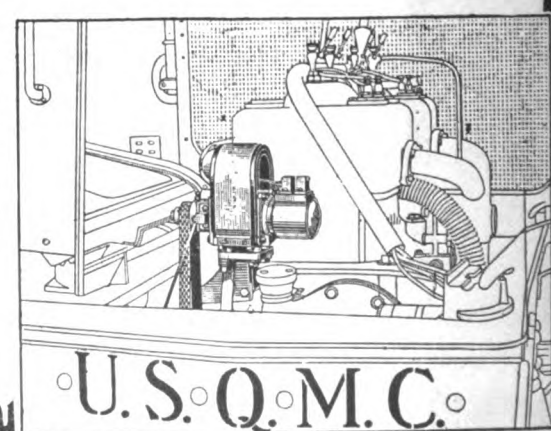
Under the hazardous conditions of service to which these army trucks are subjected, dependable, faithful lighting plays a vital part. Lighting must be certain. For this reason these manufacturers equipped their government trucks with the Vesta Truck Lighting System—the best known.

The Vesta Truck Lighting System is not an experiment—its worth has been thoroughly proved. It has been used with great satisfaction on trucks and pleasure cars for the past six years. Vesta is the truck lighting system used by the Standard Oil Co., Texas Oil Co., Armour & Co. and many other large fleet owners.

The Vesta first cost is not large—upkeep is practically nothing. A little distilled water in the battery and a drop or two of oil in the bearings occasionally are all the care necessary. And because of its simplicity and sturdiness the Vesta stands up perfectly, doing its duty year after year.

You should know more about the Vesta lighting system for trucks. Write for our booklet "Vesta Lighting System for Trucks."

Vesta Accumulator Co.
2106 Indiana Avenue Chicago, Ill.



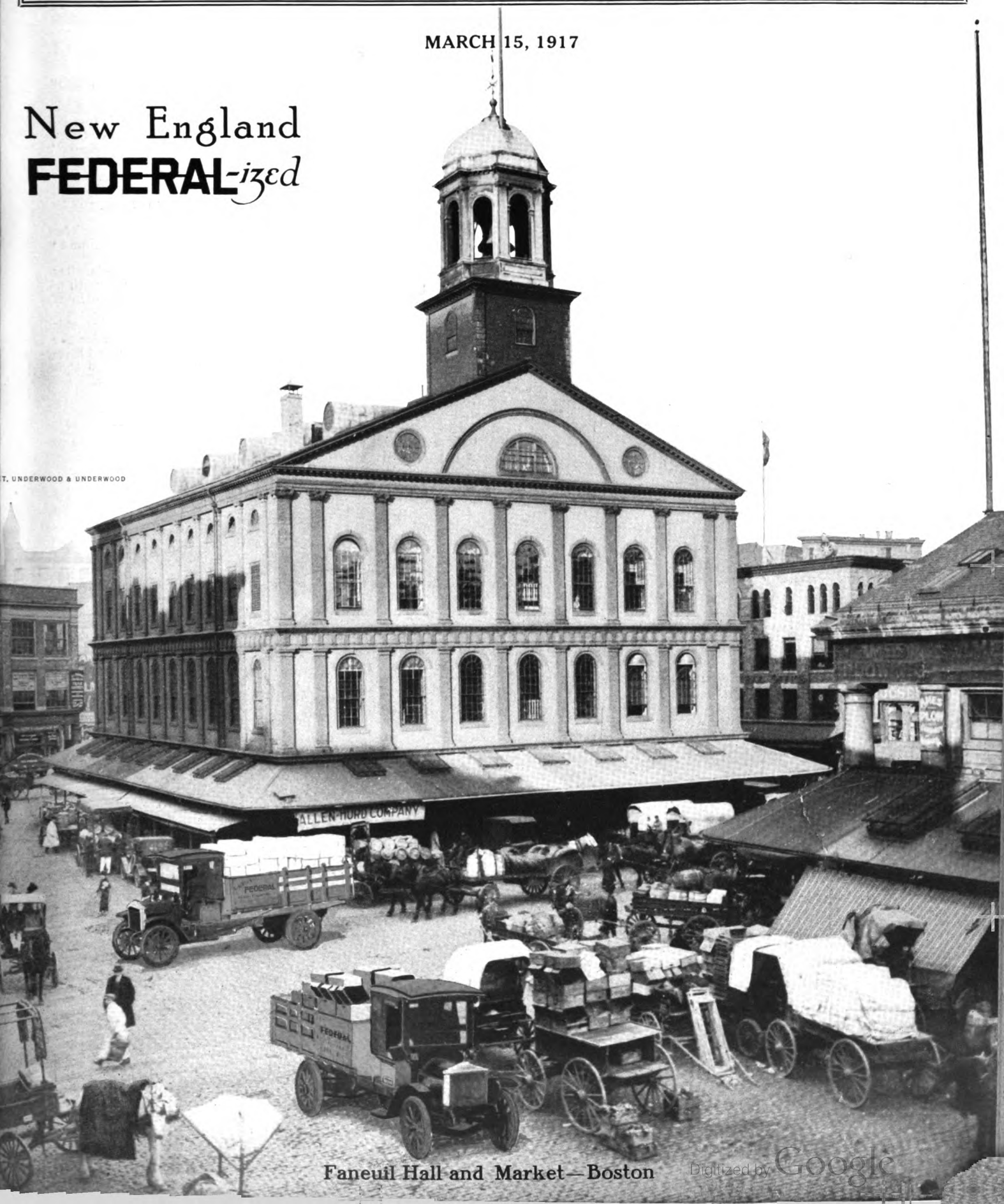
The above illustration shows Vesta Generator Lighting System on Kelley-Springfield Truck

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Traffic News

MARCH 15, 1917

New England FEDERAL-ized



Faneuil Hall and Market—Boston

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New England Bought the First Federals

The Tale of Early Days of the Company and the Efforts of Its Founder, M. L. Pulcher, to Secure Dealers



M. L. Pulcher
Federal Founder

THE FEDERAL Motor Truck Company is seven years old and the story of its success reads like the romance of the early pleasure car days.

It will perhaps be interesting to know that it was in New England that the first FEDERAL trucks were purchased. Mr. Pulcher tells us that after spending two years hard work in designing and building experimental models, he with his associates perfected the first FEDERAL Model C; soon afterwards he shipped three trucks, including the first FEDERAL built, East, one to Boston, one to New York and one to Philadelphia.

After these arrived at their destinations, he started immediately for the East.

"I went first to Boston," says Mr. Pulcher. "After looking over the field of dealers carefully in that city, I was advised that the Whitten-Gilmore Co. were very good dealers.

"They were then located on Boylston Street and were handling the Chalmers and Hudson line of pleasure cars. I called on them and endeavored to interest them in the FEDERAL trucks but was unsuccessful.

"I was resolved to secure a representative in this city and the first turn-down did not affect my determination.

"I worked on a number of other distributors and after meeting no encouragement I went back to the Whitten-Gilmore Company.

"I approached Mr. C. E. Whitten and after telling him about the FEDERAL, showing him its features, he inquired if I would drive it over to Lynn and let him work it out on the hills.

"Mr. Whitten wanted me to leave it there with him and let him run it around and do various stunts to test it out thoroughly.

"I was very glad to do this and left Boston for New York and at the Hotel Astor received a wire from Mr. Whitten telling me that the truck was "a peach" and that the check was on its way to Detroit with an order for another FEDERAL.

"Although this was not the origin of the phrase — 'Another FEDERAL'— still I believe this was the first instance of the sale of 'Another FEDERAL.'

"After my return to Detroit, we were visited by Mr. Spear of Manchester, N. H., who had talked with Mr. Whitten while at the Hudson factory in Detroit.

"Mr. Whitten had so filled Mr. Spear with enthusiasm in regard to FEDERAL trucks that he wanted to handle them in his territory.

"He immediately purchased the second FEDERAL truck built.

"News of the good work performed by the FEDERALS in Boston and Manchester soon spread to Hartford, Ct., and Mr. C. O. Britton of the Britton Company there advised us that if the truck was all that he heard about it and all we claimed, he would be glad to exhibit it at the Hartford Show, which he did. The third FEDERAL therefore went to Hartford and as far as we can learn these three FEDERALS which were built about seven years ago are all in operation today.

"This is evidence that the right kind of stuff is and always has been built into FEDERAL motor trucks."

We Are Glad We FEDERALized

By C. E. Whitten

"My early associations with Mr. Pulcher have always been a source of great satisfaction to me and I have never been sorry for one minute that he persuaded me to try that first FEDERAL back in 1910.

"I purchased the first truck solely on its merits because Mr. Pulcher was kind enough to let me take the truck and test it out on the hills around Lynn and you may be sure that I gave it a most thorough test—put it to all the stunts I could think of and it surprised me by doing them all well.

"The results of that first test have been very gratifying to me as well as to the FEDERAL Company because we have been increasing the number of FEDERALS in our territory here steadily and now it is not hard to show people why they should buy 'Another FEDERAL.'"

FEDERALS Have Proven My Prophecy

By W. C. Spear

"I purchased the second FEDERAL made because of the excellent recommendations of my friend, Mr. Whitten of Boston, and also on my own judgment as to its possibilities when I visited the factory in company with Mr. Whitten about seven years ago.

"I have never been sorry that I was able to take the FEDERAL agency.

"FEDERALS have become a habit with business men around Manchester since those early days and our success here has been due to the fidelity with which FEDERALS have been built all the way through the different models.

"Mr. Pulcher deserves not only the credit for surmounting the difficulties encountered in those early days but for the organization which has made the FEDERAL known and respected the country over."

We Had to Show Them--Then

By C. O. Britton

"In those early days—(which was only six years ago) it was pioneer work to sell trucks.

"Horses were in universal use at that time and one has only to shut his eyes to think back on the days when trucks were considered a sort of novelty. We had to convince horse owners that Motor Trucks were cheaper and even then the people had to be shown and yet we did not have any data of past performance to show them.

"However, we had the determination to get there and the FEDERAL trucks' performance enabled us to succeed splendidly.

"From eight trucks sold in 1911, we bring the total sold in 1916 in our territory up to 75 and we could have sold many more if we had been able to get them.

"This certainly bears testimony to the excellent quality of the FEDERAL trucks and perhaps some credit to your Hartford dealer.

"We look forward to the 1917 season as the one of greatest promise as the hundreds of trucks sold in Connecticut are all giving splendid returns to their owners and repeat orders are now an every day occurrence."



Canterbury Shakers Progressive

Eighteen miles from Concord, N. H., is the little town of East Canterbury.

Located here are the Canterbury Shakers, who, besides other things are an industrial organization and are well known as being manufacturers of sweaters, "Dorothy cloaks" and witch hazel as well as other products.

The question of transporting raw materials and finished products to and from Concord became a serious problem for the Canterbury Shakers.

The picture herewith illustrates how these goods are transported at the present time in a 1½-ton FEDERAL truck.

Many times trips have to be made after nightfall and the truck is equipped with a powerful searchlight to enable them to travel at night when necessary.

Through all sorts of weather this FEDERAL is doing consistent work for the Canterbury Shakers and they have had little or no trouble with it and have stated that they are very pleased with the FEDERAL and its efficiency.



Hauls 20 Tons Grain a Day

Are You A Grain Dealer?

If you are you have delivery problems of your own. You will be interested in how others have solved their problem. Here is the sentiment of but one New England owner of a FEDERAL:

"We have used a 1½-ton FEDERAL No. 875 since April, 1913. It has proven such a success that when we needed a larger truck we chose a FEDERAL without considering any others. We enclose a picture of the two-ton No. 10,330 which we bought in July, 1916.

"This truck hauls about 20 tons per day over roads that are not always the best as Vermont is very hilly." The FEDERAL is a good way out of your grain haulage problem.



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FEDERALS Are Popular With New England Wholesale Firms

THE retailer of food supplies needs a dependable delivery system but his source of supply—the wholesale house—must give him dependable delivery or he will have no need for any delivery system. Likewise he will need no cash drawer; he can look to another source for his income.

On the long list of satisfied FEDERAL owners in New England there are many prominent wholesale firms. They are giving dependable service. The practice and sentiment of a few will prove of interest to others thinking over the possibility of truck service.

E. T. Smith of Worcester, has a fleet of four and continues to buy more. The first four Smith FEDERALS are shown in the heading above. These few facts from the record of their 1½-ton FEDERAL No. 4291 for December will prove of interest:

Days in service	25
Trips	113
Deliveries	728
Loads in lbs.	265,900
Miles	543
Average trip in miles	4.8
Miles per day	21.7
Cost per day	$5.35
Cost per delivery	.18



This Maine FEDERAL Hauls Flour and Feed

Up in Maine at Portland the E. A. Clark & Co. have motorized their delivery. They were very careful in making their decision and their own words will prove of interest to you: "After looking over all other makes of trucks, we decided on FEDERALS."



Delivers Supplies to Hartford Grocers

Down in Hartford, E. H. Betts, who runs a large grocery supply house, operates a two-ton FEDERAL and they say it is giving excellent satisfaction. Massachusetts with her desire for supremacy and Springfield in particular is very proud of her FEDERAL record.



Sturtevant Merrick Co. Are Well Satisfied

The Sturtevant Merrick Co., wholesale grocers, say: "We are very well satisfied with the performance of this, the latest addition to our fleet of trucks, having operated trucks of three other kinds of manufacture previous to the purchase of the FEDERAL." The same idea in other words is expressed by H. P. Stone Co., who operate two two-ton FEDERALS. They say: "We are glad to take this opportunity to express our entire satisfaction with the operation of the two FEDERAL trucks which we bought of you this last season. The operating expenses are showing a considerable lower average than that of previous trucks which we have owned and we think with careful attention that we shall be able to still further reduce this expense."



H. P. Stone Co. Say FEDERALS Cost Less

One of their FEDERALS, No. 10,457, reporting for November, showed the following interesting items:

Months Record for H. P. Stone FEDERAL

Days in service	24½
Trips	137
Deliveries	732
Loads in lbs.	365,350
Miles	610
Average miles per day	24.9
Miles per gal. of gas	5.86
Miles per pint of oil	29.75
Cost per day	$6.05
Cost per delivery	.20



This FEDERAL Supplanted Six Horses

Still there are others in Springfield more than satisfied with their FEDERALS. Schwartz & Lepovetsky Co., wholesale fruit and produce, say; "We are absolutely satisfied with the FEDERAL truck in every respect and there is nothing for which we could find fault. We have found that we are able to do more work with our truck than we could with three pairs of horses. It has given us good service and we feel that we are in a position to recommend the FEDERAL to anyone who wants the best on the market."

Rhode Island, too, has a FEDERAL wholesaler, who is enthusiastic about the FEDERAL. Brownell & Field of Providence, have several and they continue to buy on performance. "We have just bought two 1½-ton FEDERALS on what our first one is doing." They are studying systematically the proper use of their trucks and have already learned that standing time reduces the income.

Their records on one of the trucks show that where they were taking 43 minutes to load when they began truck service, they have now by new methods reduced this to 26 minutes. There is a necessity for system even in using trucks.



This Firm Has Just Purchased Two More FEDERALS Because They Buy on Performance

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Faneuil Hall and the FEDERAL

"THE Cradle of American Liberty"—Faneuil Hall, is representative of the life and customs of both early and present-day New England.

It shares the beginnings of the American Nation—with "Old State House,"—"The Boston Common"—"Bunker Hill Monument"—the "Old South Meeting House"—and other famed spots in Boston.

That is why we have chosen it for the front cover of the "NEW ENGLAND" issue of "FEDERAL TRAFFIC NEWS."

This famous old building, located in Dock Square, Boston, dates from 1740, being presented to the city at its completion in 1742 by Peter Faneuil, a Huguenot merchant.

It was one of the first "town houses" in this country and was so frequently used for important political meetings before and after the American Revolution, that it took its name, the "Cradle of American Liberty." Its hall, above, is famous for the speeches of Webster, Choate, Sumner, Phillips, Everett and others.

Faneuil Hall has been burned down once, rebuilt and enlarged several times, but it still retains its market place in the basement.

The square surrounding the building for nearly two centuries has been a gathering place for traders in commodities—and we would relate a story of two of these traders.

The tale is a modern one with old-time settings. We have it from S. V. Norton, Manager of the truck tire sales department of the B. F. Goodrich Company, writing for System. We repeat it because of its moral—Yes, it has one.

"Two farmers engaged in market gardening within five miles of Faneuil Hall, Boston, and were keen competitors. The conditions under which they worked were practically identical and neither seemed to have the advantage of the other.

"One of them when his yearly lease expired moved twenty miles out, bought a tract of ten acres and a delivery truck. The other renewed his lease on his land and took over the land of his vacating competitor.

"The results were interesting, to say the least.

"1. The new land was about four times as productive as the land close in—saved him large sums in fertilizers.

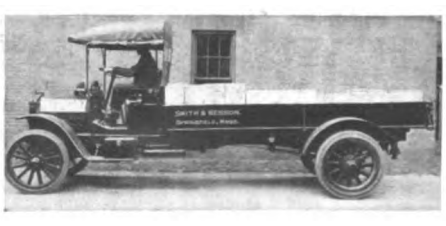
"2. The cost of the new land was about equal to the yearly rental of the land close in.

"3. The new land was two times the size of the combined plots which the other now rented.

"4. The farmer who bought the truck not only grew better produce at less cost but he has become a land owner while the other paid a high rent for less land of inferior fertility—land valued high because of its location—not its productiveness.

"5. Finally the farmer close in could not meet the live competition of the progressive truck purchaser and was forced to retire from the field.

"Moral—even though you sell your wares in old surroundings—you must be up-to-date in your methods or the other man buys FEDERALS and leaves you behind."



Landscape Gardening With a FEDERAL



Down on Cape Cod Hauling Shrubs for Private Use of H. V. Lawrence

The average person would think that a big truck with lots of power would tear up more landscape than it would make but such is not the case of the FEDERAL owned by H. V. Lawrence of Falmouth, Mass. Mr. Lawrence has a 1½-ton worm drive FEDERAL which he has been using since the Spring of 1915.

In the two years in which this truck has been in service with Mr. Lawrence it has not been out of commission for one moment.

Mr. Lawrence says—"In our landscape work of Cape Cod, we have given our FEDERAL truck very severe tests. We have hauled many thousands of trees and shrubs covering an area of forty to fifty miles in every direction.

"At times the truck has had to go into new ground which has been full of ruts and holes and indeed many times I have wondered whether we were going to be able to extricate the truck or not, but the sturdy pull has enabled us to always get out of any place that we found ourselves in."

The picture shows the Lawrence FEDERAL loaded with shrubs and trees and in the background is one of the estates on which Mr. Lawrence has worked. The FEDERAL helps Mr. Lawrence to complete a job much more quickly than he would be able to do with horse-drawn vehicles and he states its work has been entirely satisfactory.

One FEDERAL Sells Another To An Electric Co.



This FEDERAL Is a Good Investment

The Arrow Electric Company, of Hartford, consider their FEDERAL a good investment. They have proved this by ordering another of the same capacity, 2-tons.

A letter from Mr. C. A. Teneyck, of that company, to the Britton Company, FEDERAL distributors at Hartford, says:

"We consider the money spent for our FEDERAL truck one of the best investments we have ever made, and have confirmed this to you by ordering an exact duplicate of the truck originally bought.

"During the seven or eight months we have run this truck we have had absolutely no trouble with it, and it has always done the work required of it in a perfectly satisfactory manner."

FEDERALS can receive no higher recommendation than this from the Arrow Electric Company, and yet they go further and say:

"If any prospective purchasers wish to ask us any specific questions in regard to the FEDERAL truck we shall be glad to answer them at any time."

Therefore, if any reader of this publication wishes to confirm the stories of satisfaction which are recorded herein, and this one in particular, they have only to write the Arrow Electric Company at Hartford, who will be glad to give them any information.

FEDERAL Solves Delivery Problem For Piano Co. of Boston



The C. C. Harvey Company do a very large piano and musical instrument business in Boston, and have used various kinds of delivery service including several makes of trucks, for the past eight years. They say:

"We can positively say that until purchasing the FEDERAL in April, 1916, we did not commence to appreciate the possibilities that lie in a delivery truck, as we had experienced so much difficulty with the various makes we had operated previously."

If any product can be sold to give more satisfaction than is claimed for it, then its continued success is established.

The Harvey Company say further:

"We assure you that the FEDERAL truck we are now using has to date given us satisfaction in excess of our anticipation and your claims."



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There Can Be No Delays in the Dairy Business

DAIRYING is regarded universally as one of the most progressive and highly developed forms of farming.

The total value of milk products in New England is enormous. Motor haulage is fast becoming a necessity in the dairy business, because of the fact that it requires 365 days per year operation; in fact, the whole structure of the dairy business is built upon its delivery.



Mr. Andrews Explaining to His Horses That He Has Found Something Better

Chauncy W. Andrews, who lives near Waltham, Mass., on May 1st, 1913, purchased his first FEDERAL truck to haul milk because he figured that the distance does not matter so much if you can cover it within a reasonable time with your haulage equipment.

This first truck made sixty miles per day, day in and day out, and became so valuable an adjunct to Mr. Andrews' business that he purchased his second FEDERAL April 1, 1914, or about a year after the first one.



One of a Fleet of Two FEDERALS Hauling Milk

This second FEDERAL lived up to the reputation of the first one for it made fifty miles per day every day for eighteen months without losing a trip.

On May 22, 1915, or about two years after he purchased his first FEDERAL, Mr. Andrews traded in this original FEDERAL for a worm drive FEDERAL.

This truck was put on as a delivery truck, supplying customers in Waltham.

It took the place of two teams and it made stops for over three hundred customers every day. Up to date, nearly a year since its purchase, this truck has not been overhauled and is going fine.

Mr. Andrews says—"I cannot say too much for the FEDERAL truck."

About eighteen miles from Hartford, Conn., is a small village called Bloomfield; near Bloomfield is located Benbenuto Farm, owned and operated by Thos. B. Perkins.

The product of this farm, consisting of milk and heavy cream, is delivered to wholesale customers in Hartford, necessitating a trip of about thirty-five miles per day.

With horses it is a day's trip to drive to Hartford and return with a load of cream and empty cans coming back, therefore to cut down this time and have more to devote to his farm, Mr. Perkins on April 1, 1915, purchased a FEDERAL truck.

Mr. Perkins tells us that since then this truck has never been out of order nor given him the slightest bit of trouble.

"Indeed," says Mr. Perkins, "our bills for repairs, including spark plugs, have not yet amounted to $5.00 for almost a year's steady running.

"I am surprised myself with the wonderful record this truck has made. I couldn't ask for anything better, and this is the reason that I have recently placed an order with you for a two-ton truck to be delivered this coming April to take care of our increased business."

The increased business of which Mr. Perkins speaks is the direct result of being able to serve his customers efficiently and economically, and he gives the FEDERAL the full credit for its helpfulness in improving his dairy business.



FEDERAL Gets Credit for Increased Business

The Textile Trade Turns To Trucks

THE textile companies of New England, were among the first to realize the advantages of motor equipment both for the handling of raw materials from loading platforms to factories, and for the hauling of finished cloths, woolens, cottons and silks.

FEDERAL trucks have become big factors in the moving of textiles in this region.

As New England furnishes the world's largest portion of the cloths for wearables, it is necessary that their product be moved without loss of time and in the most economical manner.

Competition, which is keen, enters into the equation of haulage very largely, therefore the record that FEDERALS have made in other lines of business was one of the reasons why many textile industries have equipped with FEDERAL motor trucks.



This FEDERAL Hauls Textiles at Bridgeport

Among others who are using FEDERALS in this business are the Salt Textile Manufacturing Company, of Bridgeport, Conn.; the National & Providence Worsted Mills, branch of the American Woolen Company; Finney Company, Pawtucket, R. I.; the Hamlet Textile Company, Woonsocket, R. I.; and the Boston Duck Company of Bondsville, Mass.



The American Woolen Mills Use FEDERALS

This last company has been using the FEDERAL for the last six months and is very much pleased with it.

Mr. E. G. Childs, Agent of the Boston Duck Company, writes us that their FEDERAL is doing the work of more than that done by two two-horse teams previously.

In January of this year we gave a whole page to the excellent records of the LeBon Bleach & Dye Works, of Pawtucket, R. I.; from it we quote:

"In the midst of a great manufacturing district, liberally supplied with producers of textile products, the Le Bon Bleach & Dye Works have found an excellent opportunity for the carrying on of their particular business. This business like many others is founded on service of a transportation nature. A successful pick-up and delivery system is absolutely essential.



Finished Cloths Are Thus Hurried to Consumers



Thousands of Machines Are Supplied by FEDERAL

"We find that we are able to do much more work at a lower cost with the truck than we formerly did with the different express companies and our horse and team, and furthermore, our first truck paid for itself in less than nine months."

As far as we know, every FEDERAL operated by the large companies engaged in the textile business throughout New England, has been satisfactory and they are thoroughly satisfied with the FEDERAL haulage equipment. We have yet to hear of one complaint from them.



FEDERAL Helps to Keep Thousands at Work

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Traffic FEDERAL News

Published in the interest of
ECONOMICAL TRANSPORTATION
by the
FEDERAL
MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

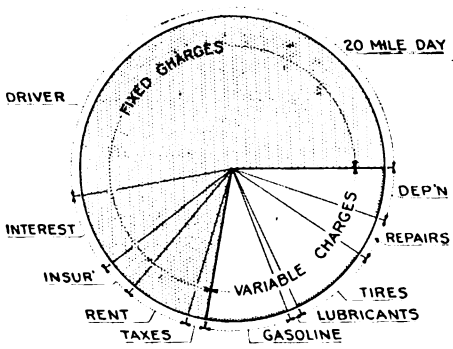
Edited by: L. B. DUDLEY : Advertising Manager

EDITORIAL

The Value of Comparison in Cost

IN truck transportation costs we have pointed out before that the daily fixed charges decrease as the daily mileage increases. Some illustrations will help to get this fact more firmly fixed in our minds.

It is interesting to the careful observer to know the reason for some things which have a daily occurrence. Knowing is a basic element in success. Civilization has advanced by this very principle and we can expect the progress of the future to build on the things that are seen and understood.



The Ratio of Costs in a 20 Mile Day

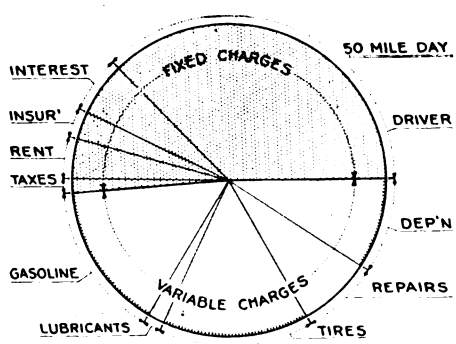
The accompanying cuts show the ratios of the individual items which make up the operating costs of a 1½-ton FEDERAL. As stated before in our discussions, these costs consist of ten parts, five of which are fixed charges; that is, charges which remain the same for every day, and five variable charges, those which depend on working conditions usually grouped under the one head of mileage.

The various items under these two heads are:

Fixed.	Variable.
Driver	Fuel—Gasoline
Interest on Investment	Lubricants.
Insurance	Tires
Garage Rent	Repairs and Maintenance
Taxes and License	Depreciation

Of all these items but one would be questioned. Many still contend that depreciation should be figured as a daily fixed charge. It may be the easier way but this way does not always prove the best or right way. The practice of many is to charge off depreciation as soon as possible. Fifty per cent the first year and twenty-five per cent the next two years is a common practice. Any such plan would not seem so bad if the transportation costs were averaged over the entire life of the truck, but where one year is to be compared with another, the first year is at a disadvantage to all others. For the sake of a fair average it is the plan of many including ourselves to figure depreciation on a mileage basis.

The mind of business through its big men is gradually coming to the point where it asks, not what an article costs but what it will do for its cost in solving our problems. We expect a certain unit of value for a unit of investment. In our transportation problems this has developed the cost per ton and the cost per ton mile or their variations which best fit the different lines of business.



The Ratio of Costs in a 50 Mile Day

Before such costs can be satisfactorily computed, a few very important items must be known, the following being the most common:

Miles of travel per day.
Tons carried per load.
Miles per round trip.
Trips made.
Deliveries made.
Hours per day.

With this data and the two charges, the daily fixed and the unit mile, we can proceed to determine our costs. The illustrations reveal two important points, which we will do well to keep in mind:

First—The greater the daily mileage, the greater will be the proportion of variable charges in the whole cost.

Second—The greater the daily mileage, the less burdensome are the fixed charges in the total cost.

In the 20 mile day the fixed charges are nearly three-fourths of the entire cost. In the 50 mile day the fixed charges are only about one-half of the total cost. If we carry the same idea a little further, we find that in a 10 mile day the fixed charge is 84 per cent. of all cost while in a 75 mile day it is but 42 per cent.

The reason for this can be found in the fact that variable charges increase in a direct proportion to the daily mileage, while fixed charges per mile decrease in proportion to the increase of daily mileage. This will readily be seen by a few figures:

Variable Charges

Miles per day	10	15	20	25	30	35
Cost per day	$ .72	$1.08	$1.44	$1.80	$2.16	$2.52

Fixed Charges

Miles per day	10	15	20	25	30	35
Cost per mile	$ .35	$ .23	$ .17	$ .14	$ .12	$ .11

Another Factor

If the cost per ton-mile is figured according to the half-load basis (see Ton-Mile Basis for Cost Figures in January, 1917, issue of this house organ) by multiplying the average load in tons by one-half the daily mileage, this cost, the basis on which we compare trucks, will vary greatly. This is because the factors composing this cost are variable factors. Loads, miles and daily cost, the variable factors in this cost problem explain in themselves why costs vary.

We will cite one concrete example to make the statements plain. A two ton FEDERAL, No. 10,077, owned and operated in Reno, Nevada, during 3 days of July carried an average load of 3,025 pounds and made an average of 59.66 miles per day. The cost for each day's work was $8.96. The cost per ton-mile for the load carried in this case is $.198.

We can find this by reducing the load to tons, multiplying that by one-half the daily mileage and dividing the result into $8.96.

3025 lbs. = 1.512 tons.
1.512 x (59.66 ÷ 2) = 45.1 ton-miles.
$8.96 ÷ 45.1 = $ .198.

If a capacity load of 4,000 pounds had been carried, the cost per ton-mile would have been reduced to $.15. Cost figures must be understood if they are to be of the most value.

FEDERALized Haulage Means Capacity For More Business

ONE of the items which every company figures when contemplating motorizing their haulage equipment is the cost of operation.

This is important, it's true, and FEDERALS can show operating costs lower than most trucks, yet many times the dealer selling the truck and the company making it, lay too much stress on this item, to the exclusion of the business building feature of motor haulage.

Of course costs should not be lost sight of, yet obviously there are a great many other things which should be taken into consideration, one of the chief ones of which is the extension of delivery radius. In other words, there is new business which can be developed with a more efficient haulage equipment. So it is well to think of both items when contemplating motorizing your delivery.

The Parfitt Furniture Company of Holyoke, Mass., have had this demonstrated to them with their FEDERAL truck. They tell us that the satisfaction they have obtained from the operation of their FEDERAL trucks —they operate several of them—is more than they anticipated.

Mr. Parfitt, treasurer of this company, says:



"This FEDERAL Enlarged Our Business"

"When one takes into consideration the large increase in our sales for 1916 and the enlargement of our delivery radius, the upkeep and maintenance of our FEDERAL trucks was surprisingly low.

"We give full credit to the FEDERAL for helping us to enlarge, reach out and get new customers.

"The FEDERAL truck, being a known and tried factor with us, will have our next repeat order which will be in the course of the next few weeks. This will show how much we appreciate the economy and aggressiveness of our FEDERAL haulage equipment."

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FEDERAL Drivers' Page

"In honestly striving for a creditable performance you dignify your work and your daily accomplishments become a permanent record that can be pointed to with pride"

FEDERAL Fleet of Six Units Is Making Good Under Close Observation of "Morehouse Bakers" at Lawrence, Mass.

BREAD—Pies—Cake, this sounds like co-operation. It is all the more interesting since wheat is so high. It may be rye bread and johnnycake. The latter sounds more like home than a bakery.

The Morehouse Baking Co. in Lawrence, Mass., keep six FEDERALS busy delivering bread, pies and cake to the small retail stores throughout the city and suburbs. Each of them make from thirty to forty miles per day. On each trip from fifty to seventy-five calls are made.

The policy and practice of this company can be a lesson to anyone operating motor trucks. They say: "We overhaul our trucks thoroughly once a year and it is our policy to anticipate the trouble rather than to wait for it to really happen. With that purpose in view we give the trucks daily inspection, drivers also reporting anything wrong with the trucks to the mechanic when they put up for the night." This reporting is not left to be done verbally but a simple form reproduced below is furnished the driver on which notations are made.

Operator's Daily Report

Truck No. ...3..... Date..July 29.
Driver.....Sherlock.....
Left....6.30.... Returned..4.10....
Od. Reading Finish.....5106.....Gal. Gas.....
" " Start..5070..Pints Oil..3..
Mileage.....36.....Lbs. Grease..2..

Repairs Needed

Take up both brakes

O. K. .....

A Sort Card, Easily Held in the Hand While Making Notations

FEDERAL owners and drivers who are still debating the value of records should weigh this comment in one of the letters from this company:

"We have for some time been using a daily service record system in connection with a monthly summary and find it a great advantage in keeping track of running expenses."

We believe this statement because for more than a year this company has furnished us with a daily service record on one of their FEDERALS, No. 3079, driven by Mr. A. Bolduc. It is the work of this truck and driver we are to take up in this sketch.

Low Gasoline Remedy

For some time Mr. Bolduc and the Morehouse Company were having difficulty securing what they believed was good gasoline economy from this particular FEDERAL. They took up the matter carefully with the Traffic Engineers of the FEDERAL MOTOR TRUCK CO. and offered hearty co-operation. Tests were suggested to find where the trouble lay. The tests were carefully carried out and the reports showed but 5.3 miles per gallon of gas. All agreed this was too low. A change in the carburetor was made and other tests carried out.

At this time the Morehouse Baking Co. said: "We appreciate your efforts to reduce our mileage costs." This is the work of this department of the FEDERAL Company. The results of the last tests showed a gasoline mileage of nearly 9 miles to the gallon. Two months since that this truck has averaged over 10 miles to the gallon of gasoline. These changes took place in April and of course the Company was watching to see if any improvement had been made. They were studying their records and in their letter of May 18, 1916, made this remark: "We note a large decrease in gasoline consumption and thank you for your interest and help in this matter."

A Particular Task

FEDERAL No. 3079 and Mr. Bolduc cover a regular route through suburbs of Lowell and Lawrence. Methuen is about two miles out from Lawrence and here three customers are served. The truck then runs to Lowell, eight miles away, where the majority of customers for this trip are located. North Billerica and sometimes Billerica, the suburbs of Lowell, are served on this trip.

During the year 1916, FEDERAL No. 3079 has performed the work shown in the record.

Yearly and Daily Average Record

Year 1916

Deliveries	21548
Miles traveled	11850
Gallons of gasoline	1761
Pints of cylinder oil	490.5

Daily Averages

Deliveries	84
Miles traveled	46.3
Miles per gal. of gasoline	6.73
Miles per pint of cylinder oil	24.1



One of Six FEDERALS on the Job Delivering "Daily Bread"

Average Cost Statement

Our average cost sheet, which includes every item chargeable to motor truck transportation, such as interest on investment, insurance, taxes, rent, driver's wages, gasoline, oil and supplies, allowance for repairs and maintenance; depreciation and tires; and which is based on authentic and actual average figures as reported by users operating in various parts of this country would show the following costs for this service:

Cost per day	$7.11
Cost per mile	.153
Cost per delivery	.084

The trucks of the Morehouse Baking Company are showing to the business men of Lawrence, FEDERAL dependability. At this time of the year with constant weather changes the value of a truck is daily proven. Their letter of January first says, "The road conditions have been bad, varying from ice to slush and three or four inches of snow."

Ten days later in a letter they write: "Since sending you the last daily service records our trucks have been running under very severe road conditions. For two or three days other users of trucks laid them up and used horses and sleds, but we kept our trucks going."

What could be more proof of the dependability of the FEDERAL? What share of this fine performance is due to the driver? We suggest that the reader look to the opposite page where a cut is shown giving the driver's importance in truck costs. We believe in good truck drivers. We are glad to give this page to Mr. Bolduc and one of the FEDERALS operated by Morehouse Baking Co.

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Heard From New England FEDERAL Enthusiasts

Geo. H. Eames & Son, Keene, N. H.—Wholesale and Retail Grain Dealers.

We use our FEDERAL Truck constantly summer and winter, and would hardly think of parting company with it if we could not get another. If anyone is at all skeptical, as we were before buying a truck, let them write us.

Aaron King, Claremont, N. H.—Light and Heavy Teaming.

Wish to say that I am satisfied in every way with the FEDERAL Truck which I am using. Have been up and down the Connecticut River and across the states of New Hampshire and Vermont. We have never come to the hill yet that we could not make with full load. Have had no trouble whatever—truck has not been laid up for a single day.

C. H. Bangs Druggists' Fixture Company, Boston, Mass.

We purchased a FEDERAL truck, No. 168, from your concern at the Auto Show in March of 1911. It has been in continuous and almost uninterrupted service since that time. Our factory being located thirteen miles from the heart of Boston, the truck easily does the work of five or six horses, making sometimes three round trips to Boston in a day.

We consider our investment in the FEDERAL truck one of the most satisfactory we have ever made, all things being considered.

C. H. Eddy & Co., Brattleboro, Vt.—Mfrs. of Beverages, Extracts, etc.

We desire to express our satisfaction with the "FEDERAL Truck." It has been in constant use for three years and has been practically no expense to us for repairs during that time.

The country over which it has been driven is as you know extremely hilly and the roads in some parts are pretty poor, yet it has always gone where we sent it and has always come back.

On the whole we are pleased that we selected this truck.

D. F. Hutchinson & Sons, Lexington, Mass.

On February 20, 1914, we received a FEDERAL truck, Model "H", 1½ ton, and since that time it has been in service every day with the exception of about one week. We average about fifty miles per day on the year's running. We have used the Firestone tires and on the rear wheels have averaged about 12000 miles per tire, on the forward wheels we get 16000 miles per tire.

Although the truck has been used three years, and we have a 3½ ton FEDERAL truck coming, the present one is doing good service, and we have no bother with it whatever.

With best wishes for continued success, we remain.

Breck-Robinson Nursery Co., Lexington, Mass.

After a thorough canvass of the motor truck field in 1914, we purchased one of your 1½ ton models, and we have certainly had no cause to be disappointed in its performances. It has handled whatever work has been given it without difficulty, and the cost of maintenance has been most reasonable.

John Merrell, Agawam, Mass.—Milk Business.

I take pleasure in speaking a good word for the FEDERAL truck.

Our 1½-ton machine is doing excellent work seven days in the week and at present is on the go half of the night.

It's a model H. No. 1244 and has seen several years of hard service.

We have been too busy to keep accurate account of expenses, but it goes and comes day after day with very little expense except oil and gas.

Chas. A. Nash, Springfield, Mass.

The 1½-ton truck I purchased of you has proved very satisfactory in every way. It makes a trip of seventy miles every day on six gallons of gas, which I think is unusual and proves that it has extra good power.

E. R. French, Bedford, N. H.—Cattle Dealer.

Transport live stock to distances of fifty and sixty miles. A great thing in my business; a great saver of time, very reliable and economical.



FEDERALS Help To Keep Soft Drinks Cheap

Another branch of New England's industries is getting acquainted with FEDERAL economy. The makers and dispensers of soft drinks find that in this truck they at last have a help to combat rising costs. Boston is represented by the Richmond Carbonated Beverage Co., who own a 1½-ton FEDERAL No. 885.

Rhode Island, too, is represented by the Sanitary Bottling Co., at Auburn, who own FEDERAL No. 1605. The Country Club Soda Co., of Springfield, have this to say of their FEDERALS: "The purpose of this letter is to show our appreciation for the FEDERAL truck. In the summer of 1915 we purchased a FEDERAL. It has greatly increased our business since by giving the people service regardless of the weather. Our business then required another truck, and knowing no other truck that we would exchange for, therefore have recently purchased 'Another FEDERAL' of course. The cost to maintain the FEDERAL is very low."

What more would such a company want than dependable service regardless of the weather? Our records of their FEDERAL No. 3216 show that during twenty days of January 63 trips were made totaling 518 miles. One hundred forty-five deliveries were made and 67 gallons of gasoline were used. This means that 7.73 miles were traveled for every gallon of gasoline used. During this same period over 43 miles was made on every pint of cylinder oil. This economy is characteristic of FEDERALS.

During these twenty days 26 miles was covered every day and the cost of operation, including the driver and other items which are usually charged to truck operation amounted to less than $5.50.

The FEDERAL is a dependable unit which will aid any company looking for economical transportation.

A. Regnier, Manchester, N. H.—Truckman.

My FEDERAL is a great truck. Has covered twice the distance of other trucks which are now in the junk heap.

Crowley Brothers, Concord, N. H.—Wholesale and Retail Ice Dealers.

Have had FEDERAL truck in constant use over good and bad roads. It is a great truck; has increased my business and I expect to buy another FEDERAL.

Farmer & Nelson, Newport, N. H.—Teaming and Trucking.

Our FEDERAL does the work of six horses. Running better when we put it away this fall than when we put it into use three years ago. Don't think there is a better 1½-ton truck made.

Christensen Bros., Chester, Conn.—General Trucking.

This firm operated one of the first 1½ ton FEDERALS coming into this territory. They are very critical men and are familiar with mechanical appliances. This truck brought a repeat order for a Model M in 1916 and during the same year they investigated all makes of trucks with the idea of putting on a long distance moving van. Their investigation revealed that the Model L FEDERAL was equal in value to any truck on the market costing considerable more money. This has been in use now several months on New York, Boston and Philadelphia moving trips, and through their representation has been the means of selling several other trucks.

C. B. Carlson, Higganum, Conn.—Bottling Works.

Mr. Carlson has operated a 1½ ton 1912 since that date. It has given him perfect satisfaction and at the present time he could be sold nothing but a FEDERAL when in need of one. This truck appears to them to be good for several years service yet.

B. F. Burrows, Mystic, Conn.—Coal and Wood.

The history of this transaction would make very good reading but is too long to be given in the space you would allow. Our dealer was up against competition of practically every make of truck within this capacity but finally succeeded in selling. They are very much satisfied with the operation and think they were wise in selection they made.

C. Schlossberg, Norwich, Conn.—Grain Dealer.

This owner was very much in favor of, and had practically given his order for a smaller truck to handle his business but was finally persuaded that a 1½ ton capacity FEDERAL truck was what he wanted to produce the best results in his business. It has been in use about one year with the result that in the spring they are putting on "Another FEDERAL."

Hall Bros., Concord, N. H.—Wholesale and Retail Auto Supplies.

We cannot speak too highly of the merits of the FEDERAL truck. It has been in constant service for over a year, and we have had to expend absolutely nothing for repairs. Very economical on gasoline and oil. If we were to put another truck into operation we would purchase a FEDERAL chassis without looking further.

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BOCK

Everything Rolls

Every load carrying contact in the Bock Bearing is a *rolling* contact.

Everything rolls.

There is no thrust or end friction—no sliding and scraping.

For the end of each Bock roller is a section of a perfect sphere—and *rolls* in unison with the tapered rollers.

Consequently you get the great strength of the roller bearings *plus* the best features of the ball bearings.

And this important combination *is exclusive in the Bock.*

Automobile engineers everywhere have been quick to recognize the advantages of such a bearing. And the Bock is replacing other types in motor cars as rapidly as we can fill the orders.

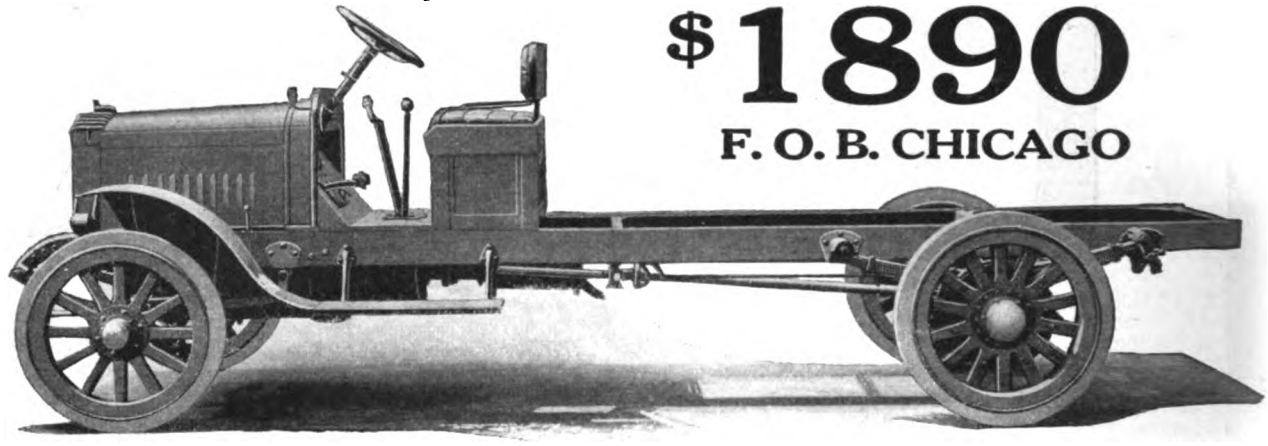
The Bock Bearing Company, Toledo, Ohio

Ball Ends

The only roller bearing with frictionless rolling end contact

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MASTER TWO TON TRUCK



$1890
F. O. B. CHICAGO

Result of Fourteen Years Experience Concentrated on One Model

Master Two Ton Truck, built in one model only, is the result of fourteen years of experience in every phase of motor truck manufacturing, selling and operation. In it the designers have intensified every truck strength. Eliminated every truck weakness.

Every feature of design is thoroughly tested, and every element of construction is developed to the highest point.

Loading platform width and heighth from ground, length of frame, proportion of strength to load carried—of power to work done—is based on a careful study of motor truck operation since the inception of the industry.

In Master Two Ton Truck is incorporated every element demanded by users, as a result of their experience with practically every other make of truck built.

Master Two Ton Truck is built with the user in mind first, last and all the time—built for user's satisfaction—for the kind of service that develops user enthusiasm—that results in re-orders until every industry using two ton trucks will realize the supremacy of the Master Truck among all motor trucks of this capacity.

And it is backed by one of the best financed organizations in the motor truck industry.

Built to Meet Every Service Requirement

The men who have designed and built Master Two Ton Truck have been responsible for the continued operation of more than 2,000 trucks in one locality alone. The service achievements of some of these trucks has reached the astounding total of more than 150,000 miles.

The features that have contributed to this satisfaction are the features which have developed the Master Two Ton Truck.

In every line of hauling where the average load runs from 4,000 to 5,000 pounds, Master Two Ton Truck presents such definite features of superiority that its recognition by careful buyers must become universal.

The Biggest Truck Value Ever Offered

Concentration on one model, and that model adapted to the field where the sale of heavy duty trucks is largest, has resulted in a product which, measured by specifications, service standards and price, is the most tremendous value in the motor truck industry.

Every manufacturing energy is devoted toward one accomplishment—that of building the best two ton truck at a price which represents a highly individual value.

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Complete Your Line—Add this "Big Demand" Model—Now!

Live dealers all over the country are completing their pleasure car line with motor trucks; and live truck dealers are getting a complete line-up of models. Master Two Ton Truck fits a place in motor truck sales not occupied by any other. Its superior quality—its "big demand" price make it a necessary addition to any line of motor trucks sold.

Big Features that Make Sales

Each specification in Master Two Ton Truck is a specification of proved value—of big sales influence.

Buda Motor—Famous heavy duty type, with proved higher power development for its size than in any other truck motor. Wonderfully smooth operation. Remarkably efficient oiling.

Ignition—Bosch DU 4 high tension magneto, with fixed spark.

Carburetor—Special Master-Buda design. big fuel economy uniform carburetion under all weather conditions.

Clutch and Transmission—Unit with power plant. Specially constructed nickel steel gears: chrome nickel steel shafts. Clutch multiple disc, steel faced with Raybestos. Soft and smooth in operation.

Steering Gear—Irreversible type worm and split nut construction, an exceptionally efficient, easily handled steering gear.

Torbensen Internal Gear Drive—A time tried, owner proved system with no load carried on live axle. Extra heavy I beam dead axle carries weight of truck and load.

Guarantee bond protecting load carrying axle for life of truck furnished every owner.

Springs—Semi-elliptic, front and rear, extra wide, extra long, extra heavy. Even under tremendous overload all the weight is carried on Master springs.

Frame—Channel section 6-1/16" deep.

Wheels—Artillery type, exceptionally heavy, strong spokes. Tires, 34 x 4 front, 36 x 6 rear.

Brakes—Emergency, internal expanding type on rear wheel brake drum. Service, external contracting type on rear wheel brake drum.

Other specifications include Timken front axle and bearings, specially constructed steering arm and tie-rod, highly efficient radiator with cast housing, flexibly suspended and truly leak-proof.

Act Now!—While You Have the Chance

Applications are now being received from dealers in all open territory.

The wonderful value offered in Master Two Ton Truck is instantly apparent to the real dealer, doing a real business.

Send in your application now for new territory. Do not delay until it is too late.

MASTER TRUCKS, Inc.
3132-3136 Wabash Avenue, Chicago Ill.

Master Trucks, Inc.
3132 to 3136 Wabash Ave., Chicago, Ill.

Kindly send me full information regarding your dealership proposition. Also send me book descriptive of Master Motor Truck.

Name.....
Address.....
City.....
State.....

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive $1095

Two-Ton Worm Drive $2200

Three-and-One-Half-Ton Worm Drive $3100

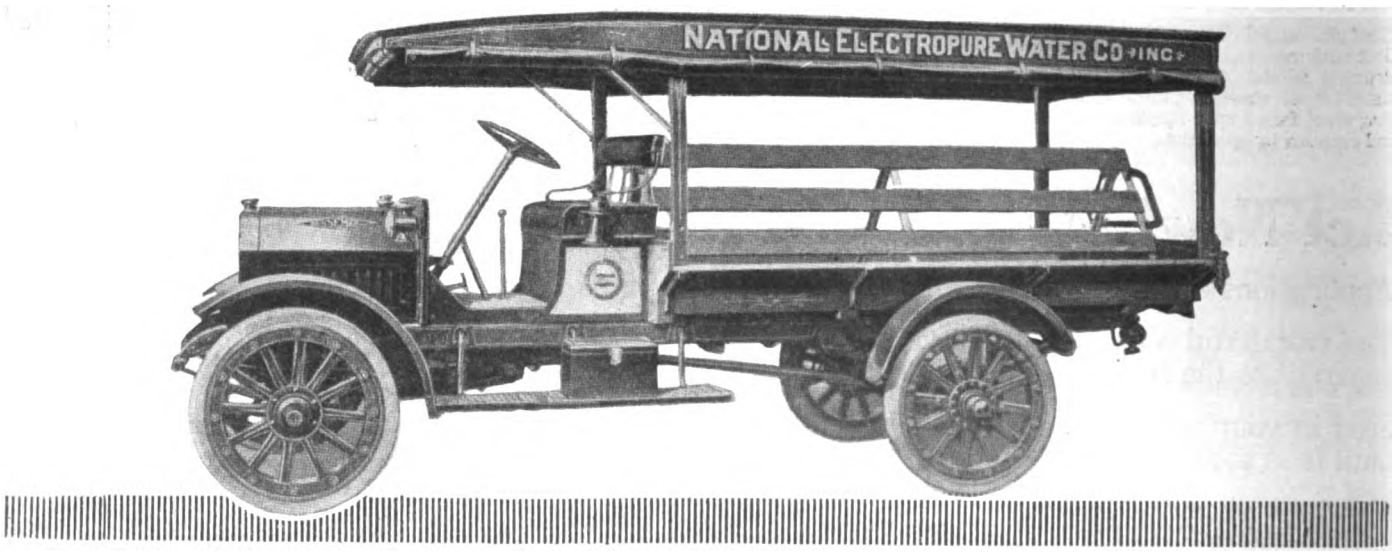
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

Bessemer Motor Truck Company **Grove City, Pa.**

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State

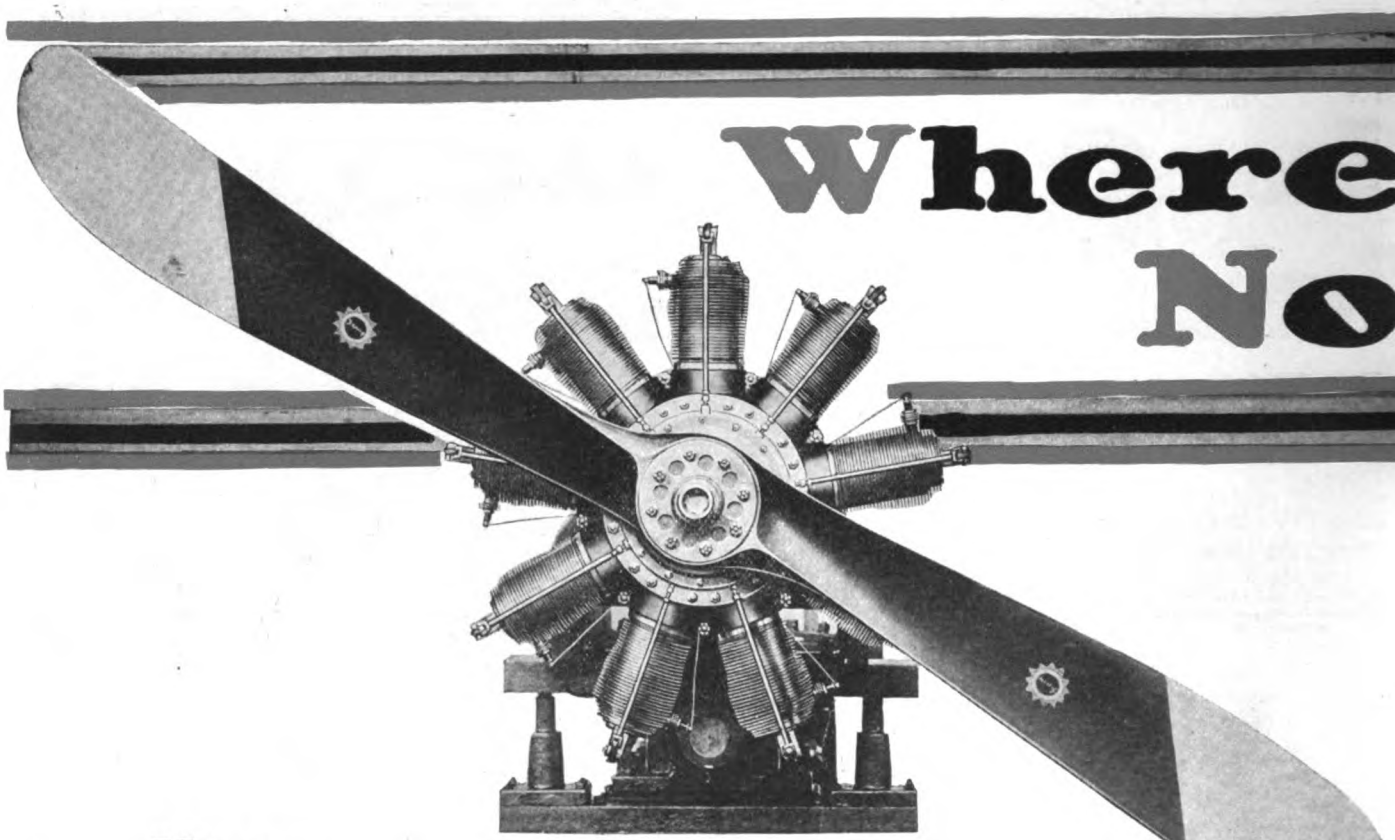


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Where No



Efficiency—

That is the sole consideration of the General Vehicle Company in the production of the Gnome engine, illustrated herewith.

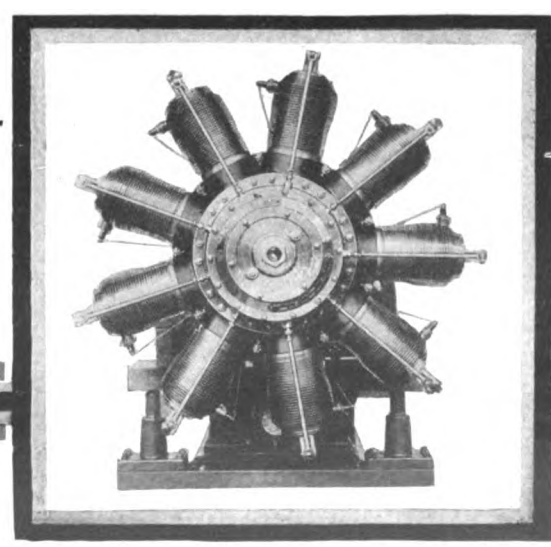
And bear in mind, too, that efficiency means not alone performance and endurance—but it also means

Safety—

That's why, in selecting the bearing equipment for Gnome engines U. S. BALL BEARINGS were chosen by the General Vehicle Company.

U.S. Ball

U.S. BALL BEARINGS



At the top of this page is shown a front view of the Gnome engine with propeller fitted. At the bottom is the same view without the propeller.

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There Can Be Compromise —

STILL further evidence of the unquestioned superiority of the ball bearing as an anti-friction device is furnished by the almost universal use of ball bearings by aeroplane manufacturers.

As we have stated in our heading to this advertisement, in aeroplane products there can be no compromise. A man, soaring up into the air at a speed of maybe a hundred miles an hour and at a height of anywhere from a thousand feet to a mile or two from the ground, takes no chances in the equipment of his machine.

He wants efficiency—speed, power, endurance—but more than that, he wants reliability and absolute safety. These attributes are assured him in the highest degree by the use of ball bearings at all friction bearing points.

The fact that the General Vehicle Company could save money by using substitutes for ball bearings has had no weight with them in the design of these 100 H. P. Gnome engines. As stated before, the intention has been to produce the very finest piece of mechanism possible to manufacture and to do this it was obviously essential to equip these engines with ball bearings—with U. S. Ball Bearings.

And whenever any manufacturer of any machine in which it is necessary to overcome friction selects ball bearings, as anti-friction devices, you may be sure that manufacturer is earnestly endeavoring to produce the highest class product that can be built.

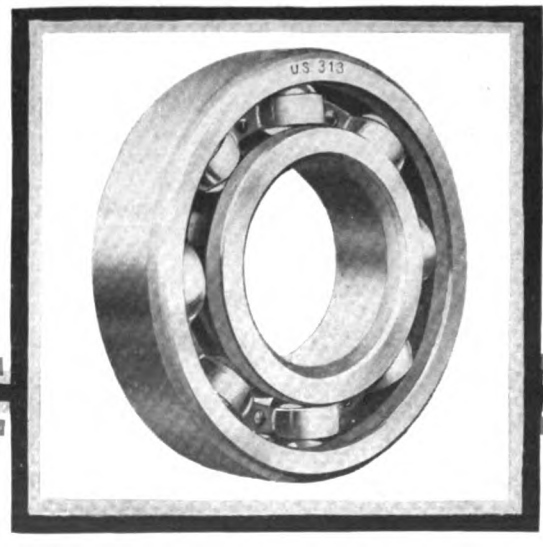
U. S. Ball Bearing Mfg. Co.

[CONRAD PATENT LICENSEE]

PALMER STREET AND KOLMAR AVENUE
CHICAGO, ILLINOIS

Bearings

Illustration on this page shows one of the Standard U. S. Ball Bearings used in the General Vehicle Company's 100 H. P. Gnome engines.



U.S. BALL BEARINGS

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Announcing

"The Baby Wood"

HYDRAULIC HOIST

(TYPE "E")

—the lightest,
—the simplest,
—the most positive,
—the quickest-working

And the **most easily installed** dumping device made;

—the inevitable choice—therefore—of the 1917 buyer of light dumping equipment.

Expressly designed for trucks of 2-ton capacity; but equally adaptable to one and 3-tonners.

Supplied with new special model rear-dump body, forming an ideal combination for every manner of light hauling and dumping.

Weight approximately 250 lb.; requires a space of only 13½ inches between body and seat; body arms are outside of chassis frame.

Made to fit any chassis.

With production about to begin on this new model and every indication of a nation-wide demand, we again recommend that prospective buyers of this type of equipment communicate without delay.

Particulars upon request. Address all inquiries to Detroit.

Wood Hydraulic Hoist and Body Co.

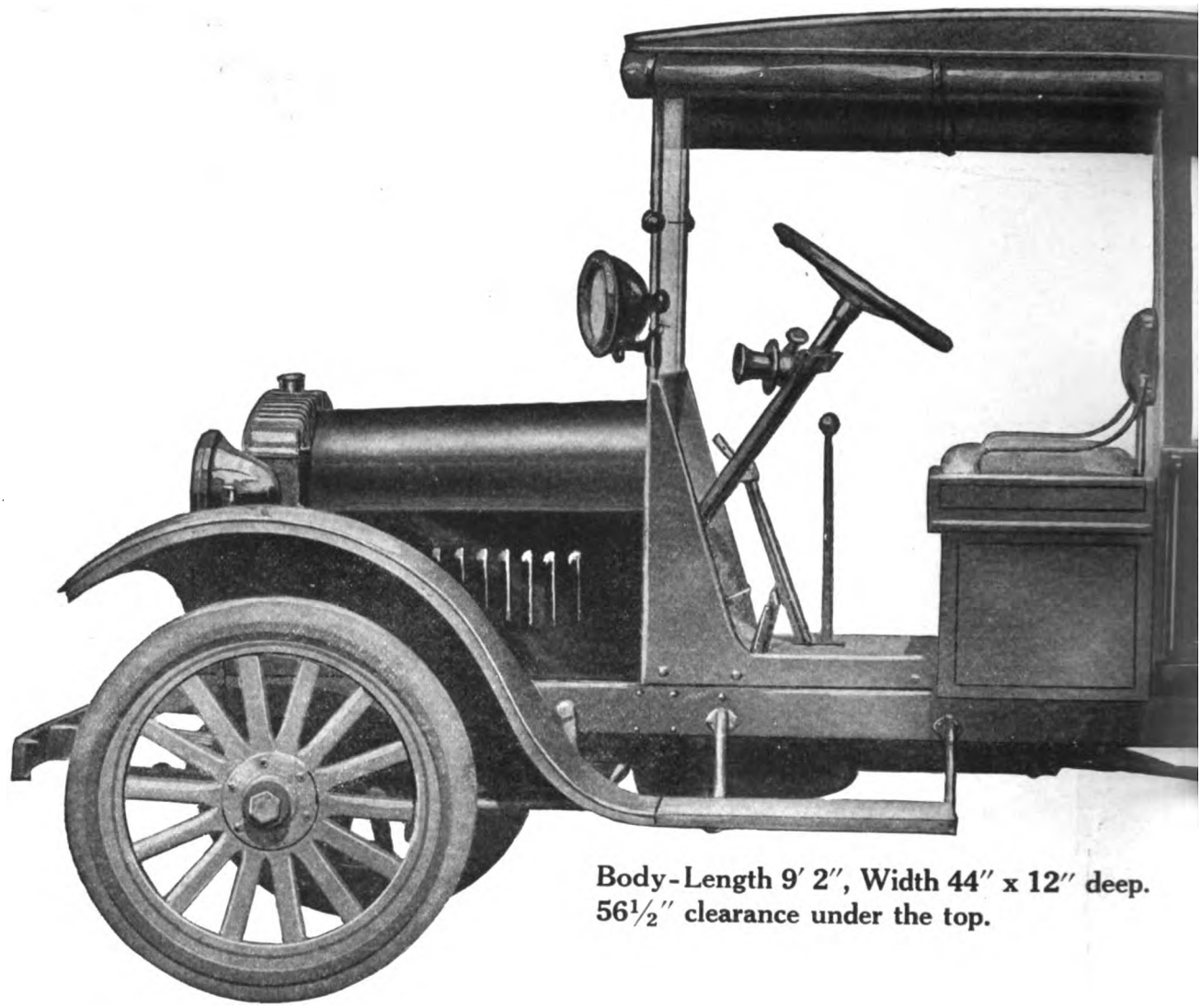
Sole Manufacturers

NEW YORK **DETROIT** CHICAGO

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Body-Length 9′ 2″, Width 44″ x 12″ deep.
56½″ clearance under the top.

A YEAR AHEAD OF OTHER TRUCKS

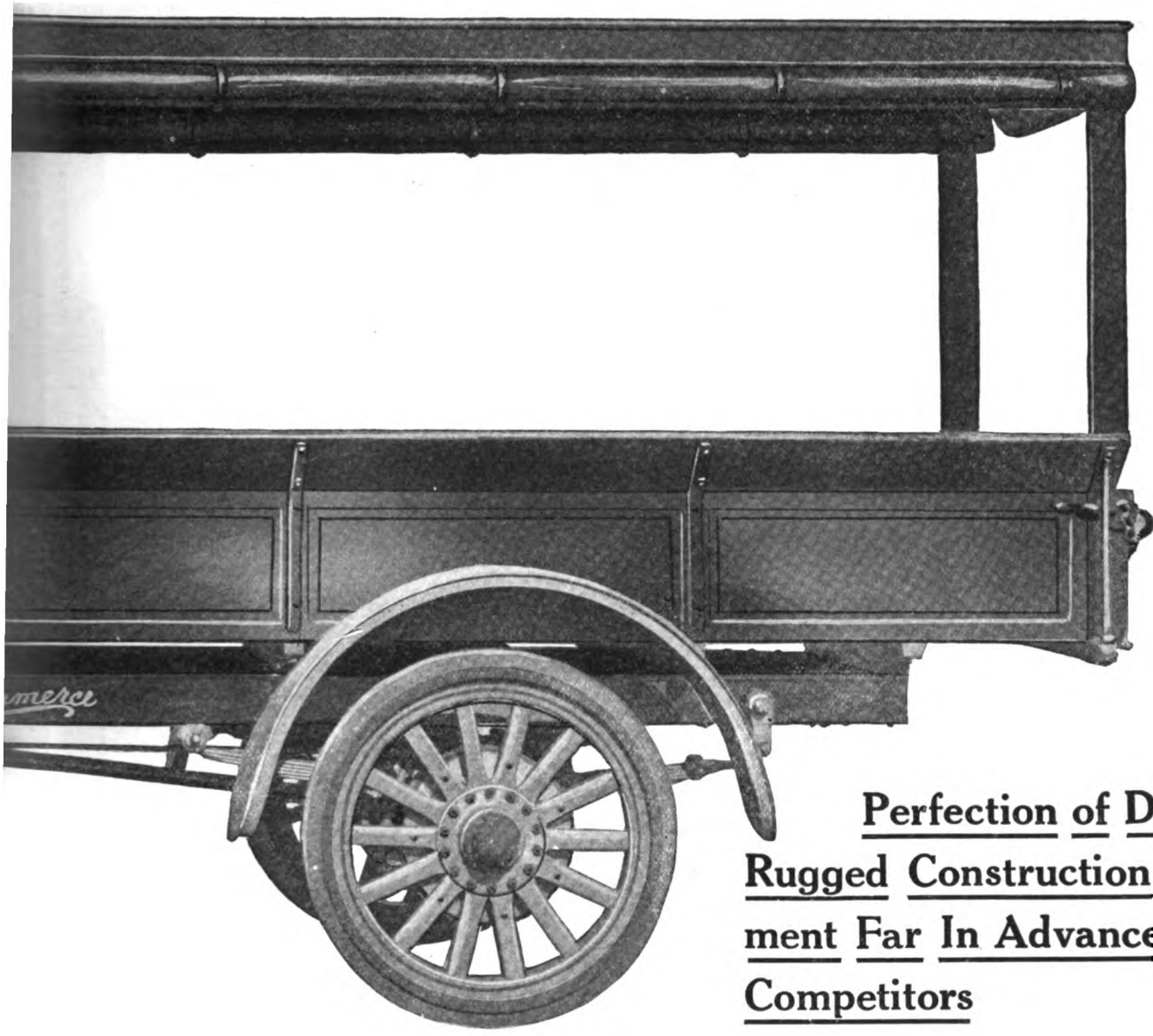
Commerce

ONE TON

MODEL EH
with complete equipment (see opp. page).
Post Top & Storm Curtain.

$1350.

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A Year ahead of other trucks does not exaggerate the advanced position of Commerce Trucks.

Of the highest possible quality in design and construction, they are thoroughly equipped with the latest aids to efficiency.

Other trucks have some of these things, but the Commerce is the only one having ALL of them NOW.

That these aids are needed in order to obtain the very most out of a truck is clearly indicated by the promptness with which other trucks are preparing to follow our example.

Next year doubtless all trucks will be so equipped—or as near it as they can get—

But right now the Commerce is the only one with absolutely complete equipment already on the truck when bought, and included in the purchase price.

COMPLETE EQUIPMENT

Three Types of Bodies—Windshield—Remy Starting and Lighting—Spotlight—Bumper (integral with frame)—Large Searchlights (with dimmers)—Stewart Vacuum System—Pierce Automatic Governor.

QUALITY UNITS

Continental Motor—Torbensen Internal Gear Rear Axle—Cast Tank Radiator with Removable Core—Truck Type Roller Bearing Front Axle—Unit Transmission, special truck type—Detroit Steel Products Company Springs.

These, together with special truck frame and fittings such as are usually found in a truck of 2 tons capacity, are the principal units that enter into the construction of the "Model ES" Commerce 1-ton Truck.

¾-Ton Model, $1075. Supplied with 3 types of bodies

DEALERS: Have you seen the Commerce Method of advertising you in your home town? Have you seen the SHORT Commerce Contract? Are you in on our "Big Business" campaign for 1917-18? If not, write us TO-DAY for details.

Commerce Motor Car Company

DETROIT MICHIGAN

W. H. Brinkerhoff, Eastern District Manager, Belmont Avenue, Elmhurst, Long Island, N. Y.

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WINTHER MOTOR TRUCKS KENOSHA, WIS.

The Survival of the Fittest

Internal Gear Drive
Locking Differentials
Drop Forged Axles
Timken Bearings
Four-Bearing Crank Shaft
Force Feed Oiling
Optional Wheelbase
Variable Frame Lengths
3½% Nickel Gears
Constant Mesh Transmission
Vanadium Steel Springs

The history of WINTHER parts is a story of elimination under the intensive working conditions of firing-line service.

In United States Army trucks on Mexican duty the parts that made good under heaviest strain are the parts incorporated in the four WINTHER models—the first complete line of American made heavy-duty internal gear motor trucks.

Reliable parts—tried and true—comprise the specifications of the WINTHER.

Model 47—1½ to 2-ton, Maximum 4,000 lbs.
Model 67—2½ to 3-ton, Maximum 6,000 lbs.
Model 87—3½ to 4-ton, Maximum 8,000 lbs.
Model 127—5 to 6-ton, Maximum 12,000 lbs.

We have a liberal distributor's offer for a few well-organized and well-financed dealers.

The Winther Motor Truck Company

Kenosha **Wisconsin**

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What Signal "*On the Job*" Means to the Manufacturer

The best purchasing agent is the one who keeps the raw material coming in a steady flow to meet your manufacturing requirements; who handles his job so skillfully and reliably that you do not have to worry about him who, in a word, "is on the job."

The best sales manager is not the sensational exploitive character who is continually endeavoring to impress you with his powers, but the energetic, able man who sells all you can make at a profit, and keeps your customers satisfied. "On the job" describes his ability, too.

The virtues of the factory superintendent who handles his work so easily and smoothly that the factory becomes a huge, efficient, producing organization may be summed up by the statement that he is "on the job."

Whether in dealing with men or machines, the expression describes the sum of all desirable values. The man who is "on the job" does not need to explain—he delivers the goods.

In the same way the expression "on the job" boils down into a few words all the desirable qualities of a good motor truck. Its quality is best evidenced by your unawareness of its existence. You can dismiss the truck problem if you know your motor trucks are "on the job."

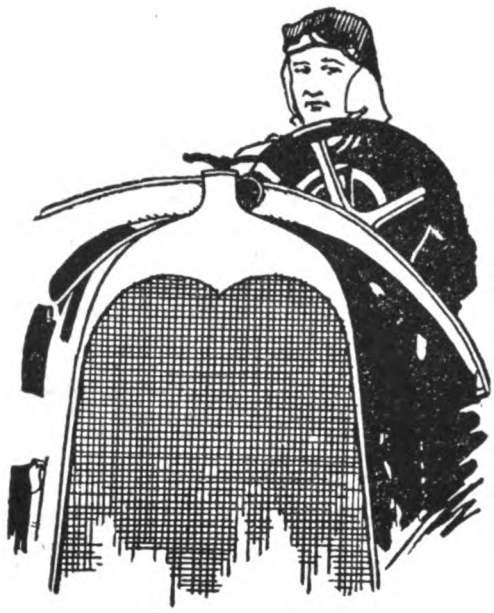
We did not fix the slogan "on the job" on Signal Trucks. It is the condensed expression of the experiences of Signal Truck users—it fits the occasion because it describes the Signal Quality. The circle of buyers for whom this applies is growing larger every day. Write

Signal Motor Truck Co.

Detroit, Mich.



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VICTORIES

Nothing demonstrates the position of FEDDERS Radiators in the American automobile game more clearly than the results of the races. Taking the racing results since mid-summer, we want to call your attention to the performance of cars equipped with

FEDDERS RADIATORS

Here is a résumé of the Fedders racing record for 1916.

Thirteen "firsts" out of twenty-seven officially sanctioned events. Forty-two "places" finished—and no Fedders-Equipt car was delayed at any time or forced to withdraw on account of cooling trouble.

1916 FEDDERS VICTORIES

CONEY ISLAND CUP RACE, 20 MILES, NEW YORK, MAY 13.

Car and Driver	Finish
Maxwell—Rickenbacher	4
Maxwell—Henderson	5

METROPOLITAN TROPHY RACE, 150 MILES, NEW YORK, MAY 13

Maxwell—Rickenbacher	1

INDIANAPOLIS INTERNATIONAL SWEEPSTAKES, 300 MILES, MAY 30

Maxwell—Henderson	6
Premier—Wilcox	7

DES MOINES 150-MILE RACE, JUNE 24

Maxwell—Henderson	2
Maxwell—Rickenbacher	3
Stutz—Cooper	5

SIOUX CITY 10-MILE RACE, JULY 8

Premier—Wilcox	4

SIOUX CITY 20-MILE RACE, JULY 8

Premier—Wilcox	4

SIOUX CITY 50-MILE RACE, JULY 8

Premier—Wilcox	1

OMAHA 50-MILE RACE, JULY 15

Maxwell—Rickenbacher	2
Maxwell—Henderson	3

OMAHA 150-MILE RACE, JULY 15

Maxwell—Henderson	4

TACOMA MONTAMARATHON, 300 MILES, AUG. 5

Maxwell—Rickenbacher	1
Maxwell—Henderson	5

CINCINNATI DERBY, 300 MILES, SEPT. 4

Peugeot—Aitken	1

INDIANAPOLIS 20-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Wilcox	2

INDIANAPOLIS 50-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Lewis	5

INDIANAPOLIS 100-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Lewis	5
Maxwell—Henderson	7

ASTOR CUP RACE, 250 MILES, NEW YORK, SEPT. 30

Peugeot—Aitken	1
Maxwell—Rickenbacher	2

GRAND AMERICAN, 250 MILES, CHICAGO, OCT. 14

Peugeot—Resta	1
Peugeot—Aitken	2
Maxwell—Rickenbacher	3
Premier—Lewis	4
Maxwell—Henderson	5
Premier—Galvin	6

HARKNESS TROPHY RACE, 100 MILES, NEW YORK

Peugeot—Aitken	1
Premier—Galvin	2
Peugeot—Wilcox	3
Maxwell—Henderson	4

VANDERBILT CUP RACE, 294 MILES, SANTA MONICA, CAL., NOV. 16

Peugeot—Resta	1
Stutz—Cooper	2

GRAND PRIZE RACE, 403 MILES, SANTA MONICA, CAL., NOV. 18

Peugeot—Aitken-Wilcox	1
Stutz—Cooper	2

ASCOT DERBY, 150-MILES, LOS ANGELES, CAL., NOV. 30

Stutz—Cooper	2

UNIVERSAL TROPHY RACE, 112 MILES, UNIONTOWN, PA.

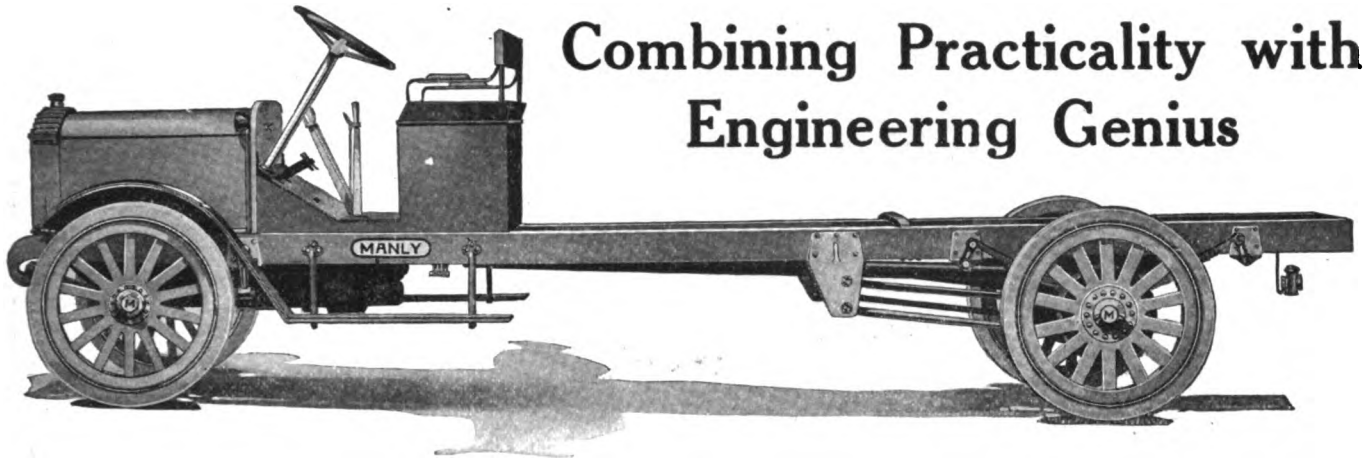
Premier—Lewis	2

This showing proves that the FEDDERS is still in its place as the foremost American Radiator

FEDDERS MANUFACTURING CO., Inc.

BUFFALO, N. Y.

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Combining Practicality with Engineering Genius

MANLY

1½-Ton 2½-Ton TRUCKS

FEATURE No. 2

A design that takes all drive and torsion load off the springs, that stops motion of the universals, prevents false movement of the driving gears and has not bending loads.

Two years of the most exacting study and experimentation by MANLY engineers preceded the appearance of the first MANLY Truck on the market.

Every pitfall, every impractical feature, of truck manufacture in the past was taken into account—and avoided. Every American and foreign truck of marked success was dissected and resolved into those components upon which success had been most dependent.

Thus upon full knowledge of what had gone before in truck development the MANLY has been built to a rigid standard of **practical perfection.** There is not an experimental feature in its makeup.

Territorial arrangements now being made for early deliveries. Wire or write. Send for handsomely illustated catalog.

Manly Motor Corporation
Factory: Waukegan, Ill.
General Offices: 1432 Michigan Ave., Chicago, Ill.

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"The Spring Is the Thing"



MATHER

Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

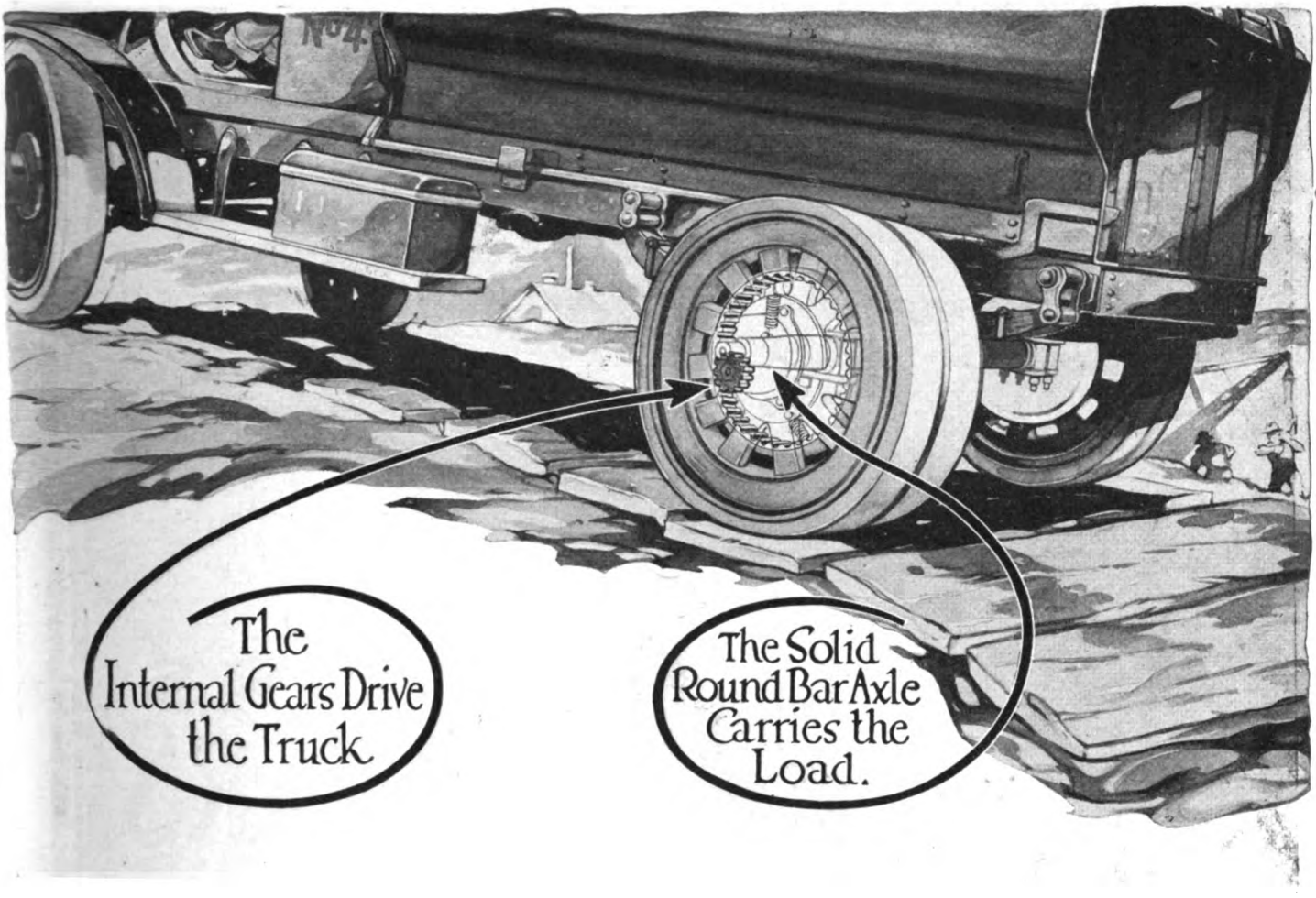
Minimum of Vibration

Genuine made only by

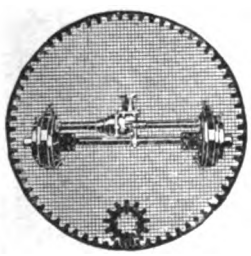
The Mather Spring Company

Toledo, Ohio

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Where Power Counts



The Russel Internal Gear Drive Axle delivers the power near the rim of the wheel—not at the hub like other shaft drives.

Prove the correctness of this principle yourself.

Jack up your truck, or any vehicle for that matter, and try turning the wheels by the rim and by the hub.

There is only one answer—why should you not specify a Russel Axle on your next truck?

Russel

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FAGEOL MOTORS COMPANY
MANUFACTURERS OF
FAGEOL MOTOR CARS AND TRUCKS
3714 SAN PABLO AVENUE
OAKLAND, CALIFORNIA

Feb.12, 1917.

Ross Gear & Tool Co.,
Lafayette, Ind.

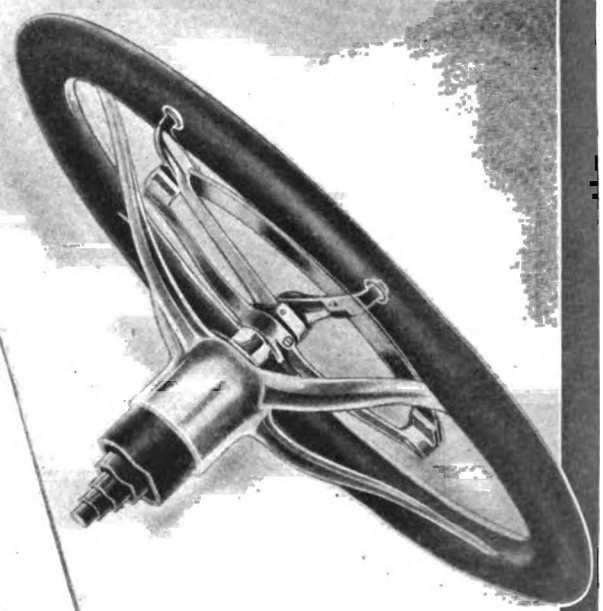
Gentlemen:

In all things I favor the best. Particularly do I believe that in building a truck, which is an instrument for heavy duty, nothing but the best is right.

The experience that we had with your steering gear while with the Thomas B. Jeffery Company of Kenosha was very satisfactory. Therefore when I decided to become interested in the "Fageol" truck, whose lofty aim is to build a better truck than has ever been produced, we placed our confidence in the "Fageol" truck, whose steering gears with the Ross Gear & Tool Company, and have placed our order with you because we are of the opinion, it is one of the best if not the best steering gear that is to-day to be found on the market.

Wishing you every success, we are

Yours truly,
Fageol Motors Company.
L.H.Bill



ROSS GEARS

The Steering Gears that Predominate on Motor Trucks



Fore and Aft Steering Gear

Made also in Cross Steering type

Ross Gears are Standard Equipment on 111 Different Makes of Motor Trucks

Write for Catalog and other information

ROSS GEAR & TOOL CO.
750 Heath Street
Lafayette .. Indiana

WINTHER MOTOR TRUCK CO.
"Quality Spells Economy"
KENOSHA, WIS.

Feb.9, 1917

Ross Gear & Tool Company
Lafayette, Ind.

Gentlemen:

We are using your steering gears on our 1917 product because of their quality.

We are endeavoring to build a truck of the highest grade units that can be produced in America, as our experience covering many years in the truck business has taught us that there is no use to build anything in a motor truck down to a price. It isn't the first cost of a motor truck to the user, but the ultimate cost figured over a period of years that is important, and the better the materials and workmanship in a truck, the less it will cost the owner.

The writer's experience on the border has convinced us that Ross gears cannot be beat by any steering gear on the market today. Three months service there would tell more than three years in ordinary commercial service.

In supplying Ross gears for Winther trucks we can assure you that your reputation will not suffer as the rest of the truck will be every bit as good as the gear.

Yours very truly,
WINTHER MOTOR TRUCK COMPANY
M O Winther
President

MPW:ER

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The COMMERCIAL VEHICLE
Read by Business Men

Published on the first and 15th of every month
Entered as second-class matter, September 13, 1906, at the Post Office, New York, N. Y., under Act of Congress, March 3, 1879

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—from the very start

THE WYMAN-GORDON GUARANTEE means forgings as near perfection as it lies in the power of men to make them

FROM THE VERY START—as above illustrated—the minutest precautions are taken. This man is not listlessly boring a hole here and there—he is proceeding in a very definite and thorough manner to get certain evidence of the slightest fault in these steel billets—none of which will be used unless proved perfect by exhaustive test.

SUCH METHODS—in vogue throughout the entire Wyman-Gordon plant—combined with an unusually helpful and expert cooperation with manufacturers in obtaining forgings exactly suitable to their individual needs—have given Wyman-Gordon products the remarkable reputation they now enjoy.

We should be glad to help solve your forgings problems.

WYMAN-GORDON CO.
Worcester, Mass. *Cleveland, O.*



GUARANTEED FORGINGS

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The Baldwin Locomotive Works Uses the Autocar

THE all-around usefulness of the Autocar—for heavy or light loads, for long or short hauls—is illustrated by the case of the Baldwin Locomotive Works. One Baldwin Autocar, known as their "office car," carries mail and makes light deliveries around Philadelphia. A second Baldwin Autocar hauls materials between the Philadelphia and Eddystone plants (twelve miles), making several trips daily. A third Autocar makes short runs from shop to shop at Eddystone. A fourth Autocar is operated as an ambulance. Autocars are the only motor trucks up to two-ton capacity used by the Baldwin Locomotive Works.

Write for illustrated catalog and list of more than 4000 concerns using Autocars in every line of business

Chassis, $1650

THE AUTOCAR COMPANY

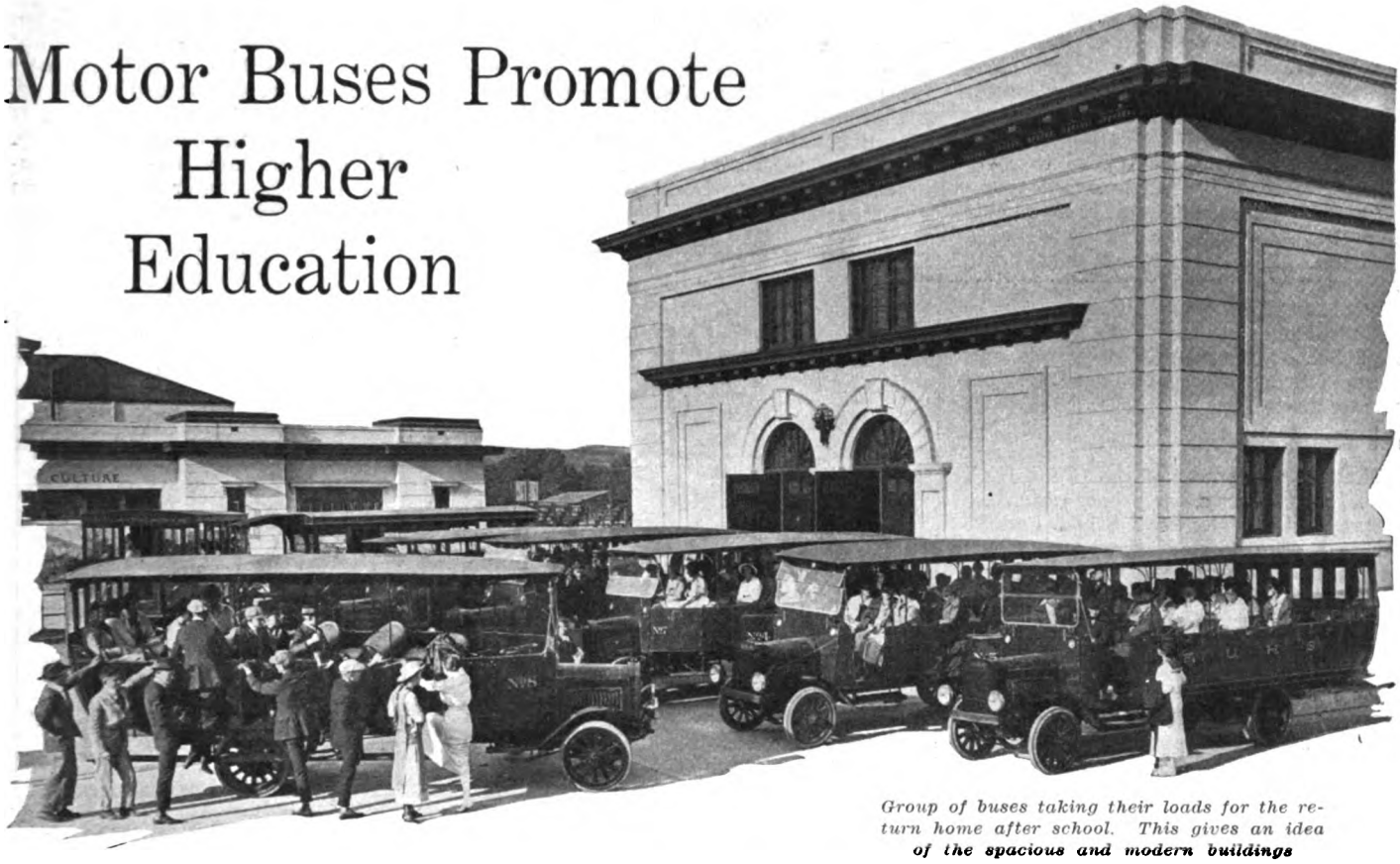
ARDMORE, PA.

Established 1897 **MOTOR DELIVERY CAR SPECIALISTS**

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI April 1, 1917 No. 5

Motor Buses Promote Higher Education



Group of buses taking their loads for the return home after school. This gives an idea of the spacious and modern buildings

By John Grant

FULLERTON, Cal., with motor trucks, has solved the problem of the ambitious boy or girl in the small town who cannot leave home to go to college. Its board of education has taken the greatest step in advancement of the community usefulness of the high school since the introduction of manual training for boys and domestic science for girls. The Fullerton board has conquered the two main obstacles to high attendance and post-graduate work of real value in the high schools of agricultural and small town districts—scarcity of dollars and over-plentifulness of mileage.

In every country community the boy or girl living in the outskirts of the town has stood a diminished chance of finishing his high school course. In Fullerton his opportunities are equalized with those of the center-of-town boy, with extras added for good measure.

Foresight, businesslike use of the imagination, high eduiational ideals, and, above all, the motor bus—these have been the agencies by which Fullerton has set an example for the country.

Planning a new high school in a district peopled by well-to-do and intelligent ranchers and oil-well workers, the trustees found their ambitions exceeded the resources apparently available for a high school, under existing precedents. Did they compromise their ideals to suit their pocketbook? That is what school boards have done, times without number. Fullerton broke the habit. Her school trustees decided to cut loose from localism and utilize the principle of co-operation between adjacent communities made possible by a California law permitting towns to join in building and operating union high schools.

Traffic and Education

They had fine paved roads leading from Fullerton to surrounding towns. If these towns would help pay for the school, their pupils could reach it in less than an hour by motor. Why not found a new educational plan on a traffic study? If a community is able to get its pupils to Fullerton by motor bus in a reasonable time, it is logical that it should come into the union and enjoy the advantages of the big school, they said. So they studied transportation, based their plans on the resources and needs of the district they could serve daily with a fleet of motor buses, and put the job through.

Here is what the motor bus has enabled them to give their district:

A Gasoline-Made School

A $300,000 school plant, including an auditorium available for general community service.

Well-equipped manual training school, and laboratories for specialized studies.

An instructing staff of specialists.

Junior college education.

A school that is big enough, and good enough, to inspire what closely approaches to the college spirit—a big influence in making school years useful in later life.

Multiplied Resources

The area served by the Fullerton Union High School includes Fullerton, Brea, La Habra, Placentia, Olinda, Lorba Linda, Richfield, and Buena Park, all having separate grammar schools, and all being towns with regular town government. In

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addition the Orangethorpe district, not a town, but having its own grammar school, is served. The estimated population of this district is 12,000, and its assessed valuation is $13,000,000. The assessed valuation of the district has a very important bearing upon this whole problem.

The Fullerton Plan

The limiting basis used in figuring a union high school plant investment is 5 per cent on the valuation of the district served, as the maximum bonded indebtedness which legally may be incurred in California for a union high school. Given a minimum figure which will provide a plant of desired efficiency, it is a matter of figuring roads, bus lines and available pupils, and assessed valuation of communities which may be tapped to cover enough territory to finance the plant without including communities so remote that the daily trip by bus would be a hardship. This is the new educational principle which should nationally become known as the Fullerton Plan.

Enrollment at the Fullerton Union High School this year is 460 pupils. Of these, 250 come and go by bus; thirty use private motor cars.

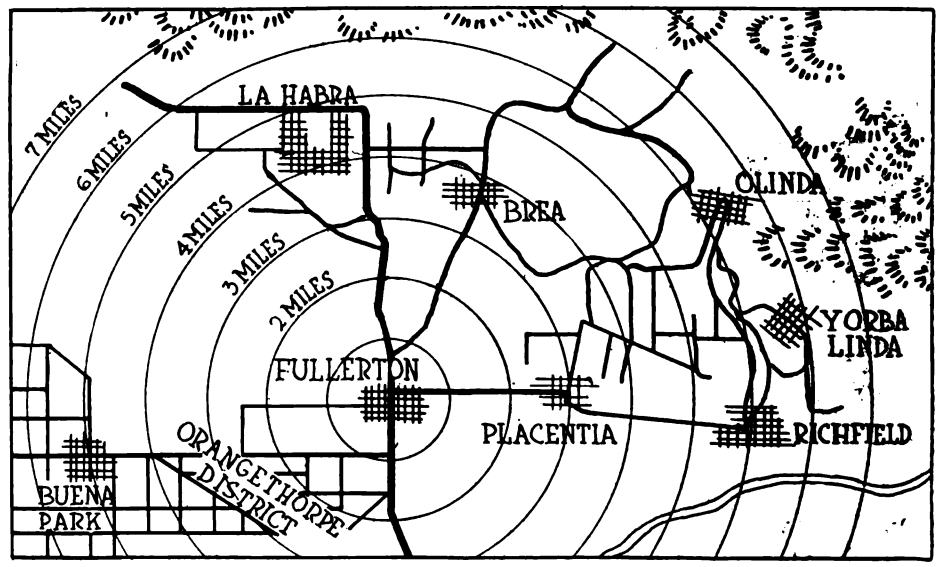
The Junior College

The drawing power of the Union High School on the grammar school graduates is remarkable. The High School gets 95 per cent of grammar school graduates; this, however, is not the whole measure of the attraction of a superior school, combined with the accessibility the transportation provides. Last year ninety-nine pupils graduated from the grammar schools and the Fullerton Union High School got practically every one available in its own district, and enough from outside to make 142 in its entering class. Twelve of these were from a community in a neighboring county, which has a bus of its own, coming 16 miles every morning and being driven back at night, making a 32-mile journey. Others walk in to convenient points on the route, where they are picked up every day.

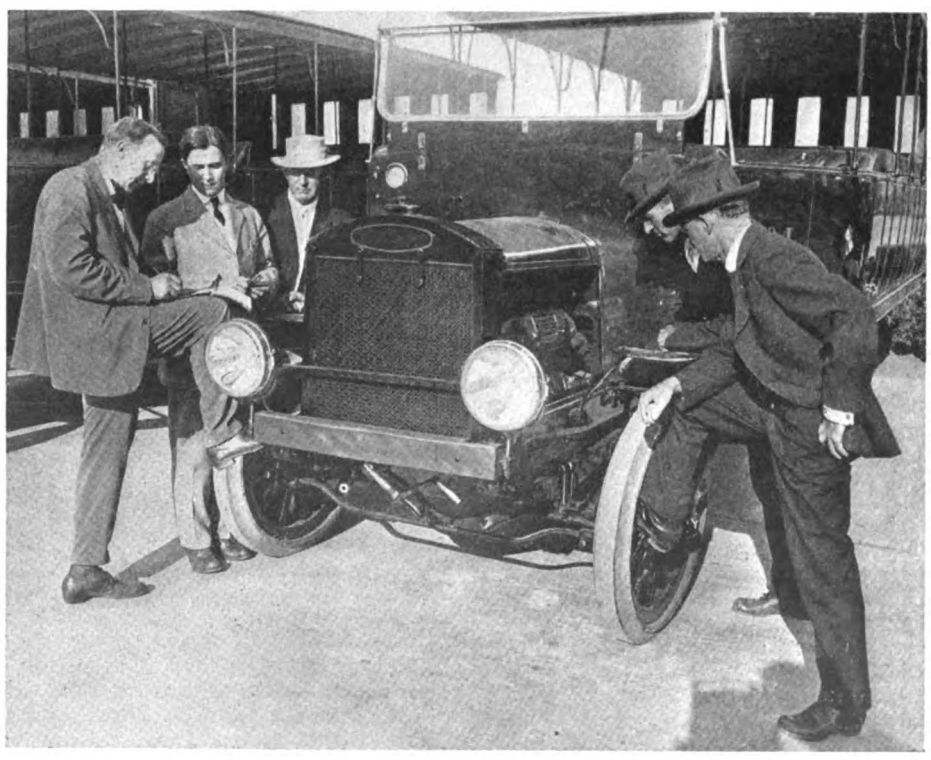
What is Junior College? In Fullerton many families think it is the greatest educational advantage of the twentieth century. A cynical manufacturer in a city where there is a splendid technical school of the second grade once remarked that it was very popular with the senior class in the high school, because it gave the boys an excuse to loaf at home 4 more years. Fullerton does not regard the Junior College as a stepping stone to a willing leisure class. The Junior College, under the California state law, provides an educational equivalent of the first 2 years in the State University.

A student satisfactorily completing his 2 years of Junior College work at Fullerton can enter the university with junior standing. This is guaranteed complete recognition by the State University, Leland Stanford, and all other colleges in California. The influence of the existence of Junior College work produces certain beneficial effects in the high school section.

Dr. Hauck, principal of the school, estimates that it influences 20 per cent of the high school students to stay on to completion of their high school course by raising the educational standard of the district. Some young people who are not doing well in the high school, but who have ambition, are encouraged by the attitude of the school authorities that if they are not doing the best kind of work in the high school they will have an opportunity to enter Junior College, even though their record would not entitle them to enter the State University. Such students often find themselves during the 2 years of Junior College work, make good before leaving there, and make good in college.



Map of Fullerton Union High School and Junior University's district, showing roads



A faculty group discussing the motor bus service. Dr. Hauck, the principal, is shown checking up on some reports

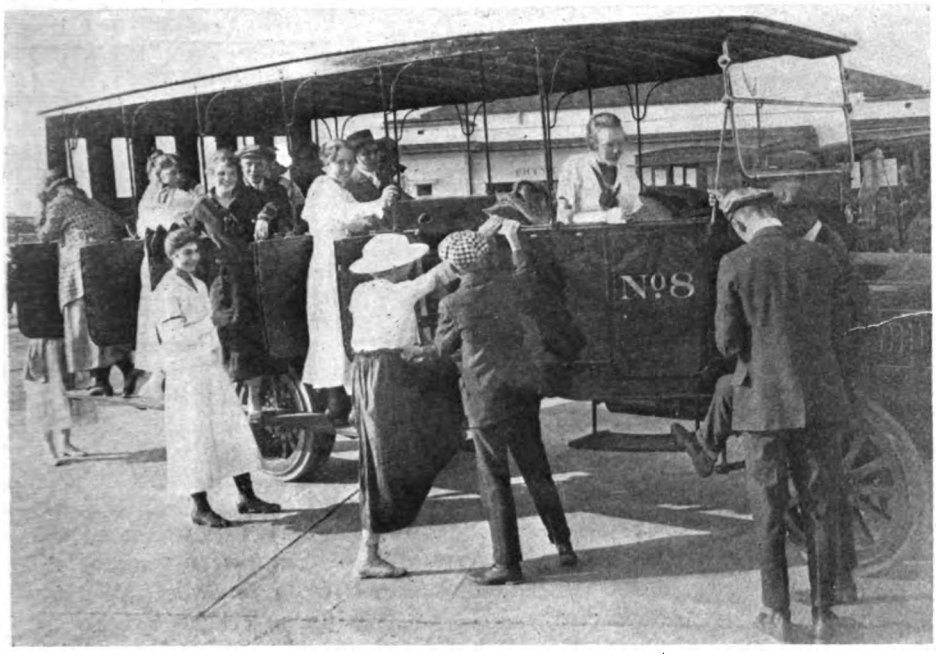
This year sixty students are taking the Junior College work. Last year there were fifty in this department, of whom seventeen graduated and twelve went on to higher universities. Some come for 1 year of the Junior College work, then go into a technical or professional school. Over half the students in the Junior College would not be able to attend any other college. If they did not have this advantage, high school would end their studies.

Transportation the Key

What part does the motor bus play in giving the Fullerton district educational advantages? It plays the part of an actual and basic creative force.

Edward W. Hauck, Ph. D., principal of the Fullerton Union High School and Junior College, conveys an idea of the efficiency and utility of motor bus transportation in the general scheme of education by comparing the conditions which probably would have existed if this had

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Evidently the student-driven buses are popular with the Phoebe Snows

not been made a fundamental of the school plant. As a matter of fact Fullerton has demonstrated that *a modern educational plant to serve a community can no more claim to be efficient without its rolling stock than could a railroad consisting of a mere terminal and unloading yard, without rights of way and rail lines tapping the country, and rolling stock to transport people and goods.*

What would the Fullerton district have had, if it had missed the idea of making transportation the foundation of its present superlative union educational plant and system? Dr. Hauck says:

> "There would probably have been three high schools instead of one. Obviously they would have been smaller, and each would have provided less than the one big school supplies. What would they have lacked? No doubt at least two of them would have lacked a very great deal. The largest of them might have been more ambitious in plan, and still, utilizing every available resource, by comparison with the present plant and staff it would have had:
>
> "Only a poorly equipped machine shop. It would have been impossible to provide the present science laboratory; impossible to have any applied art department equipped as it is now. The domestic art courses would have been skimpy. The school could not have so quickly introduced such work as Spanish. And, the biggest of all, absolutely would have had to do without its Junior College department."

Better Teaching and Equipment

In addition to the educational advantages brought about through the possibility of superior equipment this union high school plant founded on transportation has enough pupils and revenues so that it is able to introduce in its educational system a division of work to such an extent as to have expert teachers in all departments. Offering more attractive work and the prestige of association with this superior school to its teachers, it also pays better salaries, probably about 15 per cent more than the average high school.

This venture is not so new that these ideas are just dreams. The whole scheme will not blow up in a few months. Everything has been shaken down to a bedrock of fact. These buildings are now in their fifth year of service.

Educational Extension Possibilities

The school building group includes an auditorium with capacity to seat 1200, which, in addition to its strictly school functions is used by the community for an entertainment center. The high school faculty has been able to promote an entertainment course each year, bringing in artists whose talents are recognized as superior, and who are not ordinarily induced to appear in cities the size of Fullerton. Up to the present time people have entertained a prejudice against the use of busses for high school purposes, and they have not been brought into service in connection with any of these entertainments. It is very possible that in time this prejudice will pass away, and there will come to be a demand for the placing of the buses in some way at the service of the community for the entertainments, and when this comes of course it will create an additional accessibility for the entertainments, and increase the efficiency of the school plant for community service.

Not alone in an increased and more excellent plant, more specialized and more capable teaching, but also in the field of school extension work, Fullerton utilizes its command of the principle and instrumentalities of transportation to broaden the interests and training of its pupils. The buses are sometimes used by classes for a visit to the shore at the remarkably varied Laguna Beach section to study marine subjects, for trips to the mountain canyons to study mountain natural history topics, and to industrial points to study manufacturing and distribution. As a contributing factor in the athletic development of the school life, buses take their part in transportation of student participants and spectators for contests with other schools.

At Fullerton, motor transportation had been experimented with prior to the erection of the new group of buildings. Apparently the board had become fully satisfied as to such elementary points as the ability of the modern gasoline bus to make daily trips on schedule time; in fact, had learned that on good roads it is a safe, economical, and reliable method of transportation.

Bus Fleet and Its Operation

The fleet of Moreland passenger-carrying trucks is owned by the school, housed on school property, driven by pupils, and maintenance work done in the school shops.

District grammar school grounds are utilized for housing the cars at night. A garage has been constructed for each bus at a grammar school terminal and here its driver locks it up after leaving his last passenger, and goes and gets it to start his morning trip.

Drivers are selected from the older boys in the school, trained in the manual arts department. Each boy driver gets 50 cents a day. His appointment to the position is made in the same manner as the appointment of a regular employe of the school, on recommendation of the principal approved by the board of trustees. The appointment is good for the entire year; the opportunity for earnings and fascination of the job are an incentive to competition for the driver's place, which is a wholesome factor in the ambitions of students in the manual training department.

The average run on the routes laid out to serve this district is 25 miles in a day, this being the mileage of the inward and outward trips. The shortest run is 16 miles both ways, and the longest run is made by a bus which is kept at the high school grounds and goes out on a circuit route, making 35 miles in a day. The most distant point reached by any route is probably about 8 miles by air line. The territory served lies in all directions but one from the school. The school is closer to the population center than to the territorial center of the district.

Motor Influence Important

Transportation as a factor in community development is subconsciously emphasized in the mind of every high school youth twice a day. The general tendency of educational work at Fullerton is to localize its influence and cultivate the home feeling, to make the students wish to utilize their training for the improvement and development of their own neighborhood. If Fullerton achieves the beneficent condition of completely motorized transit ahead of any other town in the United States it will probably have its school buses to thank for its leadership.

Nearly everything Fullerton has in the advantages of its present educational system is made possible by motor bus transportation. This article is not writ-

(*Continued on page* 20)

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Our Commercial Vehicles Best

RECENTLY a man high up in the purchase of supplies of all kinds for the European belligerents commented that of all the machinery and manufactured articles purchased in America, the commercial vehicles had generally given the best account of themselves. They measured up better to the requirements than much of the ammunition bought here, than many of the machine guns, and than many other purchases. This is a particularly attractive compliment to our truck industry, and chiefly so to the dozen or more truck makers who have supplied the bulk of the machines to the European belligerents. To date we have furnished many thousands of trucks, which all but a few over fifty have reached European ports in safety. These trucks have gone into especially severe service, service more severe than we can imagine in this country, but in spite of this supreme test the vehicles have a most excellent record for themselves. This should be an inspiration to every truck maker.

Truck service in the war is super-abnormally severe for a variety of conditions. Much of the truck work is done at nights and done without lights. Very often a truck is working 36 hours in succession, half of the time in darkness over roads punctuated with shell holes, broken bridges and other obstructions. Very often these trucks are in the hands of none too good drivers, drivers who have not had long enough experience in handling machines. Add to this lack of truck knowledge the fact that very often these drivers are working 18 or 20 hours at a stretch and one may understand how the truck must suffer. After a driver has been on the job for 18 hours he does not give his vehicle that attention which he does when going on fresh in the morning and being at the wheel perhaps 8 or 10 hours. To this, add the other disturbing fact that when shells are screeching overhead there is an amazing tendency to keep pushing the accelerator pedal down, and very often the truck strikes a hole much harder than it would in normal service.

The present war has demonstrated that what is needed more than anything else after dependability in war trucks is accessibility. We have still many lessons to learn in this regard.

Mail Tubes vs. Trucks

POSTAL transfer by pneumatic tubes is to be retained instead of replaced entirely by motor trucks, in spite of all of the testimony of experts and the firm advocacy of the motor truck method by Postmaster General Burleson. While this may seem a blow to the truck, this is not actually the case. Unquestionably the tubes are more expensive than motor trucks and perhaps not so reliable, since a derangement of the tubes would hold up the whole system and perhaps entrap a great amount of important matter in the tubes, only to be extricated by the laborious process of tearing them up and opening them; but that they are retained will result in good to the motor truck industry and to other users of motor trucks.

The whole controversy has brought the great economy of the commercial vehicle, properly applied, to the attention of the public and it has also emphasized the importance of the effect of street traffic congestion on transportation costs. That further fleets of mail trucks are not put upon our most crowded thoroughfares means that more room will be left for other vehicles. The place that would be occupied by these trucks will be taken by others. Instead of a host of mail drivers, we will have an equal number of commercial drivers. No one class of drivers have done more to stir up antagonism against motor trucks in the public and journalistic mind than those who drive postal trucks.

It has been definitely established that postal tubes can transfer the mails more quickly and without increasing street traffic congestion; but the fact remains that motor trucks are the cheapest method known. Such use as the tubes are put to is only a portion of the transportation needed by the post office and the evidence favorable to the motor trucks which the tube controversy has brought to the attention of the public and the post-office officials can only result in promoting their use in the other services. Publicity on what trucks can do means more trucks sold.

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Wins by Imitation and Initiation

DID you ever hear of a businessman's department store? What type of a man would you expect to change an ordinary office stationery and office furniture concern into a businessman's department store?

You might answer, a businessman of the first water. And you would be correct for that describes C. P. Koehler, vice-president and general manager of the A. W. McCloy Co., Pittsburgh, Pa., perhaps better than any other five words one might select. Progressive, dynamic and quick-spoken, Koehler still retains that underlying fundamental of business ability which has enabled him to double the business done by his company in the past 3 years.

His keen business sense enabled him to realize the possibility of the motor truck as a valuable business-getter. He was quick to discern that the volume of business done by any concern is dependent upon the service rendered the customers of that concern and that the product and other conditions being equal, the company which offers the best service gets the lion's share of the trade.

His Trucks Give Department Store Service

Being a progressive businessman, Koehler was not afraid to take a chance. If trucks would increase his business, trucks he would have. So he bought first one delivery vehicle, then another and finally a third, meanwhile dispensing with the services of the horses formerly used to deliver his company's product.

And therein lies the story of the businessman's department store. Pittsburgh's conventional department stores are the most highly motorized of any in the entire United States. Of the 2,500 trucks of ¾-ton capacity and over in that city, between 250 and 300, or 10 per cent or more, are owned by department stores. Even the smallest of the stores use motors, maintaining fleets of four or five commercial vehicles. These motor trucks have enabled the department stores as a class to give the best possible service to their customers. Most of the stores make two deliveries per day within a 30-mile zone, and several deliver as far out as 45 miles.

With the reputation of the city's department stores for excellent service by motor as an example, Koehler decided that if his concern was to expand and gain the ascendancy over its competitors, he too must offer a delivery service equal in reliability and quickness to that offered by the department stores. The only way in which he could offer such a service was to install motor trucks, and he did.

Koehler's Trucks Deliver from 1 Oz. to 1,075 Lbs.

Just as the department store will deliver anything from a package of pins to the largest piece of furniture, just so will Koehler's trucks deliver anything from a 1-oz. bottle of ink to a 300-lb. desk or a small cabinet safe weighing 1,075 pounds in the crate. He will not only deliver such articles anywhere within an 8-mile radius of the store, but will actually get the goods out of his store and on the way to their destination within 1 hour after the receipt of the order, or even sooner if it is urgently needed. With such excellent service, Koehler's company may truthfully be termed a businessman's department store.

This service has enabled the McCloy company to double its business in 3 years. In turn, the motor truck has been the chief instrument by which the expansion was made possible.

Besides employing his good business sense to aid him in the decision to purchase trucks and to coin a new designation for his company based on those trucks, Koehler has similarly applied good business methods in their operation. In this respect he has simply followed the precedents which he established in other departments of the company's affairs, for Koehler's rise in the McCloy concern has kept in step with its great expansion during the past 3 years.

Born in Pittsburgh 42 years ago, he has walked steadily up the ladder of promotion in the 6 years he has been identified with the concern. First he was a salesman, then sales manager, later assistant general manager and finally reached his present position of vice-president and general manager. Thus it is seen that he has earned his reward for different service rendered, just like any other man who gives his best will eventually get his advancement.

Tall, sinewy and quick-spoken, Koehler is well liked by his drivers who know that good work does not go unnoticed and who yet realize that they cannot deceive him. In fact, Koehler considers his drivers of the greatest importance, and has devised several bonus systems by which they receive additional cash in direct proportion to their efforts. For example, he pays 1 cent a package extra for all delivered over a certain number in a given territory. He also presents $25 every year to each driver who has obtained 5,000 miles from the tires on his truck. In addition, he gave $25 to the driver of each truck who ran it throughout its first year without repairs due to the driver's negligence.



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Better Truck Maintenance and Repair

Two Pages Each Issue on the Best Repair Ideas for Owners

Write us a letter telling how you maintain your trucks efficiently or of some good motor truck repairs you have made

WITH the intention of helping motor truck owners and operators to save themselves money in the efficient maintenance and repair of their trucks, THE COMMERCIAL VEHICLE *inaugurates on these two pages a new department in which better methods of maintaining trucks and the latest ideas in making quick repairs will be published.*

THE COMMERCIAL VEHICLE will pay the minimum of $1 for each new idea which it accepts on better truck maintenance or good repair jobs you have made, or as much above that amount as the idea is worth. Simply tell us exactly how it is done and send a rough pencil sketch showing clearly the method employed or the device used.

All owners of motor trucks have at some time or other been confronted with the problem of making some repair which at first seemed difficult but which they have solved easily by some simple method or by some simple device. Let us know how you have overcome your difficulties. Send us a simple sketch showing just what your problem was and how you solved it.

THE COMMERCIAL VEHICLE will publish your ideas and give you credit besides paying at least $1 for each idea which it accepts. All readers of THE COMMERCIAL VEHICLE are eligible to send in their ideas, whether they are subscribers or not. The more are sent in the more benefit you will receive because of the greater number of ideas published.

It matters not whether your trouble was with your radiator, motor, clutch, gearset, jackshaft, rear axle or any other part of the truck. If you have a new method of repairing any part of your vehicle, tell us about it so that by publication, other commercial vehicle owners may profit from your ideas and you in turn from theirs. Let us eliminate the tendency to hide efficient truck maintenance and repairwork in a veil of secrecy for fear of benefiting your competitors just like the Chinese sought to keep foreigners out of their country by the great China wall. Remember that he who gives also receives.

For instance, many years of experience has taught A. H. Leipert, service manager of the International Motor Co., that loss of engine power is one of the greatest troubles which the average owner encounters. While it is true that the loss of engine power can generally be traced to either carbureter misadjustment, ignition trouble or lack of compression, the average driver confronted with such a problem will at once attempt to adjust the carbureter and perhaps get it entirely out of order instead of testing compression as outlined fully on the opposite page. Loss of power may be due to other causes, such as a slipping clutch, etc., but read how Leipert first tests for compression, then ignition and finally for carbureter adjustment. Try this plan. It may save you many dollars during a year.

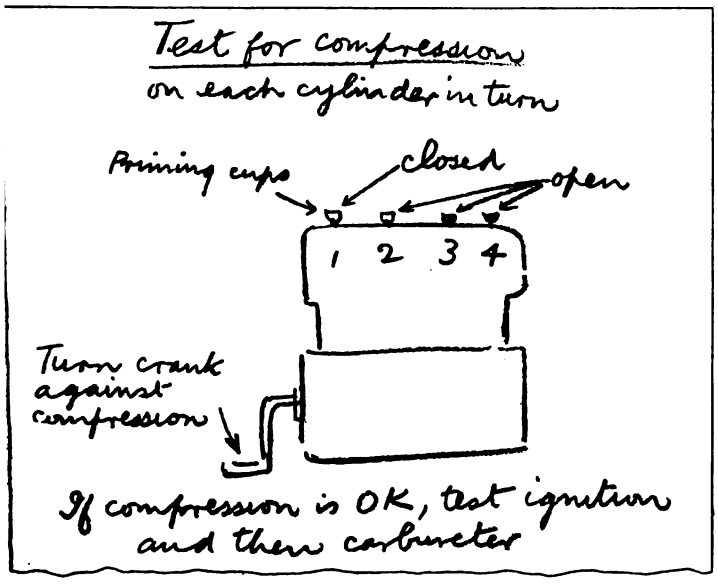
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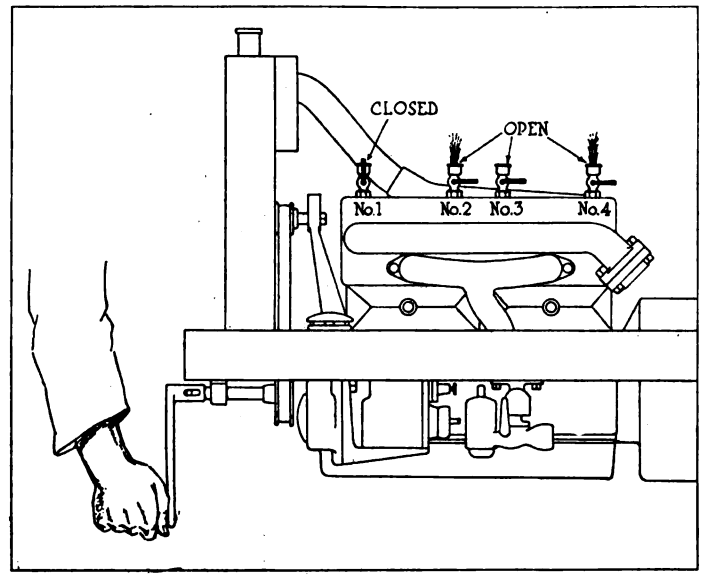
Here's an Example

Testing for Power Loss

How Leipert Tests for Loss of Engine Power



Rough pencil sketch which Leipert made for THE COMMERCIAL VEHICLE



Leipert's sketch after THE COMMERCIAL VEHICLE *artists had redrawn it*

The Steps Leipert Takes in Locating Cause of Power Loss

1—Turn off magneto switch

2—Get crank on up turn and then turn over slowly.

3—Turn over slowly enough to feel compression in each cylinder.

4—If the compression in one cylinder feels weak, the next operation is to determine which one it is

5—To locate cylinder which has weak compression, keep compression pet cock or priming cup on cylinder No. 1 closed and open those on the remaining cylinders

6—Then turn engine over slowly. If compression is good, open pet cock on cylinder No. 1, close that on No. 2, leaving the others open

7—Then turn engine over slowly. If compression is good, open the cock on No. 2 and close that on No. 3, leaving the others open

8—Repeat operations as in 5, 6 and 7 until the cylinder with weak compression is found

9—If one has weak compression, examine piston rings or valves for reason

10—If no cylinder has weak compression, turn on magneto switch

11—Start motor and open pet cocks, noting if all are firing by the explosion of the gas

12—If all cylinders are firing properly, then examine carbureter for adjustment

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Horseless Vehicles to Conquer Tropics

National City Bank Statistician Addresses Business Publishers

NEW YORK, March 20 — Horseless vehicles will conquer the tropical world. This message was brought to the editorial conference of the New York Business Publishers Assn. by O. P. Austin, statistician of the National City Bank of New York, this noon at the conference luncheon in the Automobile Club.

Mr. Austin spoke on the commercial outlook, national and international, and in conclusion he showed the importance of the motor vehicle, especially as used for commercial purposes, in developing the resources of the tropics.

"The chief cause," he said, "of its (the tropics) slow development in the past has been the absence of any method by which the natural products could be transported from the place of production to the common carrier. Man could send his steamships to the edges of continents and islands, and could even build trunk lines of railways to the interior, but there was no method by which the products could be moved from the place of production to the common carrier on land or water.

"The faithful horse, which performed that service in the temperate zone, and thus enabled its development, was unable to cope with the climatic conditions in the tropics. But the lessons of the war have proved, what we suspected in the recent past, that the horseless vehicle is capable of transporting men and merchandise over comparatively roadless areas."

Trade currents will not be measureably changed by the war in the belief of Mr. Austin. He marshalled statistics and history to show that at the conclusion of hostilities conditions are likely to resume their former state. War has never broken off trade relations irrevocably in the past, and a break in precedent is not to be expected at this juncture.

The North and South resumed trade relations after the Civil War, and within 5 years after the fall of Richmond the volume of commerce between the two sections was double that of 1860. France and Germany renewed business relations after 1870 when the bitterness was fully as great as now. The imports of France from Germany the year prior to the war were $50,000,000, and the year following the war they amounted to $70,000,000. The United States and Spain were commercially friendly after 1899; and Japan and Russia did not resume trade relations after the treaty of Portsmouth.

The effect that the close of the war will have upon our current trade predominance may be judged by examining the volume of trade which existed between the belligerents before the war. Great Britain and Germany exchange $400,000,000 worth of products in times of peace. These countries can trade more profitably with each other than with a country so far distant that the transportation cost becomes a good factor. France sold $200,000,000 worth of goods to Germany, and imported about $250,000,000 from there. Russia has been exporting $200,000,000 in products to the Fatherland and importing goods to the value of $325,000,000. Altogether the volume of trade between the Allies and the Central Powers comes close to $3,000,000,000.

(*Continued on page* 21)

SOUTH SPENDS MORE ON ROADS

WASHINGTON, D. C., March 18.—Expenditure on public roads and bridges has more than doubled in the Southern States in the past 10 years, according to the recently published report of the office of public roads and rural engineering of the United States department of agriculture. Kentucky has shown the greatest progress by surfacing over 21 per cent of her roads. The favorite surface in the South is sand-clay, which is 40 per cent of the total, macadam is used on 29 per cent of the surfaced roads and gravel on 24 per cent. Only Texas and South Carolina were without State highway departments at the time that this report was published.

GROTFELD HEADS FAMOUS TRUCKS

ST. JOSEPH, MICH., March 23—R. H. Grotfeld of Chicago has been elected president of Famous Trucks, Inc. C. E. Frederickson is vice-president and general manager; John J. Seltenreich, general superintendent and purchasing agent.

PACKARD PRICES INCREASED

DETROIT, March 29—New prices for Packard trucks have just been quoted by the Packard Motor Car Co., as follows:

Capacity in tons	Former price	New price
1	$2 200	$2,325
1½	2.500	2,600
2	2.800	3,000
3	3,400	3,600
4	3,800	4,025
5	4 300	4,500
6	4,550	4,800

Coming Events

April 3-10.....San Francisco, Cal., Motor Truck Show, Home Industry League and Motor Truck Dealers' Assn. Civic Auditorium.

April 17.....Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.

April 18.....New York City, Monthly Meeting of the Motor Truck Club of America at Noontime.

April 18.....Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.

April 19.....New York City, Monthly Meeting, Metropolitan Section S. A. E. Automobile Club, 247 West Fifty-fourth Street.

New Koehler Truck on Market

Ton and a Quarter Capacity Substituted for Former 1-Ton Model

NEWARK, N. J., March 27—Still specializing on one model only, the H. J. Koehler Motors Corp. is now manufacturing and delivering the 1¼-ton Koehler truck which has been substituted for the 1-ton which was the company's first product.

The new truck uses the Koehler four-cylinder, 35-h.p., overhead valve engine, with increased compression and lighter pistons than those used for the 1-ton truck.

The chassis has been strengthened. Three main plates are used on the rear springs to accommodate the Hotchkiss drive and 1¼-ton load capacity.

Either Eisemann or Heinze magneto ignition is supplied, and the equipment consists of front and rear lamps, mechanical horn, fenders, artillery seat, tools. The open express-body is the most popular type and affords 9 ft. behind the driver's seat.

The company plans to produce over 2000 trucks during the remainder of the year.

SMITH MAKES SMALL WHEELS

SYRACUSE, N. Y., March 18. — The Smith Wheel, Inc., of this city, will put on the market within 6 weeks several new sizes of steel wheels for trucks of 1-ton capacity and upwards. These will be of 34 and 36 in. diameter for tires 3, 4, 5 and 6 in. wide, and will be for use as rear wheels. These wheels will conform to the S. A. E. standards, and will have eight spokes when used as fronts and ten when employed as rears.

COLT PRESIDENT OF U. S. RUBBER

NEW YORK, March 22—S. P. Colt was elected president of the U. S. Rubber Co. at a meeting of the directors today. The other officers named are: J. B. Ford and Lester Leland, vice-presidents; R. B. Price, vice-president in charge of development department; H. E. Sawyer, vice-president in charge of footwear department; E. S. Williams, vice-president in charge of mechanical forces; Samuel Norris, secretary; J. D. Carberry, assistant secretary; W. G. Parsons, treasurer, and A. J. Hathorne, assistant treasurer.

STUDEBAKER LEFT OVER $4,000,000

SOUTH BEND, IND., March 26—J. M. Studebaker, Sr., who died at his home here March 16, left an estate valued at between $4,000,000 and $5,000,000. His wife, children, and the children of Mrs. Lillie Johnson are the chief beneficiaries. George M. Witwer, Mr. Studebaker's private secretary, receives $25,000. Trinity Presbyterian Church, South Bend, was bequeathed $75,000.

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Driver Chief Factor in Brake Tests

Alertness Counts More Than Weight of Motor Truck

NEW YORK CITY, March 25—That the alertness and quickness of the motor truck driver is the most important factor in bringing motor trucks to a stop was the outstanding result of a series of brake tests on seven trucks held here today under the combined auspices of the New York Police Department and Motor Truck Club of America.

The Police Department officials have maintained that large capacity motor trucks such as those of 5- or 6-ton burden should not be allowed to travel as fast on the city streets as vehicles of 1- or 2-ton capacities, under the belief that the large vehicles running at a speed in excess of 10 or 12 miles per hour could not be stopped in a sufficiently short space to prevent damage if a collision were imminent. This opinion was not sustained by the results of the test, as, for instance, a 1-ton Hudford comprised of a Ford chassis and the Hudford adapter weighing light 3270 lb. in all, was stopped in 29 ft. 11 in. at a speed of 15 miles per hour, whereas a 5-ton Mack AC weighing 10,530 lb. and running at the same speed was stopped at 30 ft. 1½ in.

Some interesting results are obtained by comparing the distances in which the various trucks were stopped when light and loaded, at the same speed in each case. For instance, a 5-ton Pierce-Arrow weighing 11,250 lb. light, and running at its maximum speed of 14.5 m.p.h., was stopped in 24 ft. 11 in. and when loaded, in 25 ft. 6 in. A 3½-ton Diamond-T weighing 9310 lb. light, was stopped in 29 ft. 6 in. when running at a speed of 15 m.p.h. and in 54 ft. 3 in. when loaded and weighing 15,310 lb. This would tend to show that it requires a greater distance to stop a loaded vehicle than the same truck light when traveling at the same speed. This is undoubtedly due to the necessity of overcoming the greater momentum due to the weight of the loaded vehicle, although it was expressed by some at the test that it is easier to stop a loaded vehicle than a light one because in practically every case the brakes were sufficiently powerful to lock the wheels and the trucks skidded for from 5 to 15 ft. with the rear wheels locked.

The test was carried out on a smooth asphalt street in good condition with a slight crown to the road and a down grade of approximately 2 per cent. The method of conducting the test consisted of lining up the trucks one behind the other and then starting each one down the street paced by a motorcycle at a given rate of speed. This rate of speed was maintained up to a chalk line on the street. On crossing the line the driver applied both foot and hand brakes. The distance required to stop was then measured from the hub of the front wheels to the chalk line over which the vehicle had crossed. In addition to obtaining the distances required to stop, the observers were also provided with stop watches to record the time before coming to a dead stop in each case. The records for the seven trucks tested are given in the accompanying compilation.

RECORDS TAKEN WHEN TRUCKS WERE EMPTY

Tonnage	Make of Truck	Final Drive	Brakes Placed		Weight of Truck Light Lbs.	5 M.P.H.		10 M.P.H.		15 M.P.H.		Max. M.P.H.		
			Hand	Foot		Time in Sec.	Distance	Time in Sec.	Distance	Time in Sec.	Distance	Time in Sec.	Distance	M.P.H. Made
							Ft. In.		Ft. In.		Ft. In.		Ft. In.	
6½	Saurer	chain	rear whl	jackshaft	12,310	¾	4-11	1¾	9- 6	....	....	2¾	24- 8	14.5
5	Mack AC	chain	rear whl	jackshaft	10,530	¾	4- 4½	2	15-11	2¾	30- 1¼	3	10- 2	16.5
5	Pierce-Arrow	worm	rear whl	driveshft	11,250	1¾	9-11	1¾	15- 7½	....	....	2¾	24-11	14.5
3½	Diamond-T	worm	rear whl	rear whl	9,310	1¾	5-11½	1¾	16- 5½	2¾	29- 6	....	....	.....
2	Mack AB	chain	rear whl	driveshft	6,230	1	0- 9	2	15- 8	2¾	24- 1	....	....	.....
2	Brockway	worm	rear whl	rear whl	6,500	¾	4-11	1¾	13- 3½	2	19- 7½	2¾	29- 4	17
1	Hudford	int-gear	rear whl	driveshft	3,270	¾	6- 1	1¾	12- 2	2¾	29-11	2¾	38- 3	18

RECORDS TAKEN WHEN TRUCKS WERE LOADED

					Weight of Truck Loaded Lbs.									
6½	Saurer	chain	rear whl	jackshaft	24,310	1¾	8- 0	1¾	11- 6½	....	....	2	20- 2	14.5
5	Mack AC	chain	rear whl	jackshaft	20,530	1	7- 9	2	19- 5	....	....	3	39- 6	16.5
5	Pierce-Arrow	worm	rear whl	driveshft	21,730	1	6- 7½	1¾	13- 0	....	....	2¾	25- 6	14.5
3½	Diamond-T	worm	rear whl	rear whl	15,310	2	8- 5	2¾	17- 0	4¼	54- 3	5¼	54- 5	16.5
2	Mack AB	chain	rear whl	driveshft	9,930	1¾	8- 7	1¾	10- 8	2¾	27- 5	....	....	.....
2	Brockway	worm	rear whl	rear whl	10,700	1¾	11- 1	1¾	14- 3	3¾	39- 4	4	46- 9	16
1	Hudford	int-gear	rear whl	driveshft	5,250	¾	5- 4	1¾	13-3½	2¾	33- 0	3	14-11	20

NEW REPUBLIC TRUCK TIRE

YOUNGSTOWN, OHIO, March 26—The Republic Rubber Co. is marketing a new type of channel base pressed-on truck tire. It is designed to carry greater loads than previous types and is constructed of prodium process rubber. The tires are made in all sizes and Republic branches are being equipped with presses to facilitate prompt service. The company will immediately extend its plant to treble production.

PROPOSED N. E. L. A. STANDARDS

CHICAGO, March 18—Regulations to assure owners of maximum service and satisfactory results from storage batteries have been prepared by the Chicago standards committee of the vehicle section, National Electric Light Assn. This draft contains a list of instructions telling how high the solution should be, the proper method of watering the battery, how to clean it, suggestions for daily records, directions for charging, etc.

$1,358,810 Netted By Peerless

Balance At End of Year Equals 13.56 per Cent on Common

NEW YORK, March 23—The Peerless Truck & Motor Corp. for 1916 showed net profits of $1,358,810, after allowing for the full year's interest on the $5,000,000 notes outstanding, and after charging off $550,637 as a net loss on munitions and special foreign contracts of the General Vehicle Co. Net profits in 1915 were $2,555,773.

The balance at the end of the year, Dec. 31, was $1,358,810, after deducting $2,453 for preferred dividends on the stock of the Peerless Motor Car Co. outstanding is equivalent to 13.56 per cent on the $10,000,000 capital stock, or $6.78 per share, par value $50.

Net sales of the subsidiary companies of the truck company for the calendar year 1916, excluding munitions and special foreign contracts of the General Vehicle Co., were $13,525,023, an increase of $1,234,057 over the sales of the preceding year.

ELECTRIC TRUCKS INCREASING

NEW YORK, March 18—Commercial electrics are proving increasingly popular, according to statistics prepared by W. P. Kennedy of the National Electric Light Assn. These figures show that New York is using 2800 commercial electrics; Chicago is using 1050; Philadelphia, Pa., 510; Boston, Mass., 314; Newark, N. J., and public service territory, 321; Washington, D. C., 250; Baltimore, Md., 140; Detroit, 175; Cleveland, Ohio, 115, and St. Louis, Mo., 116. Mr. Kennedy estimates the total value of commercial electrics in the United States at the end of 1916 as $36,000,000.

STANDARD MOTOR ESCAPES CYCLONE

NEW CASTLE, Ind., March 20.—The manufacturing and service plants of the Standard Motor Parts Co. escaped all injury in the cyclone which struck New Castle, Sunday, March 11, destroying 500 homes and killing over a score of persons. Shipments were resumed the day following the cyclone.

BETHLEHEM TRUCKS GOVERNED

ALLENTOWN, Pa., March 20.—Bethlehem motor trucks are equipped with Pierce governors, driven off the main shaft, and controlling the speed of the 1½-ton and 2½-ton models to 18 and 15 m.p.h. respectively. The smaller model uses a Golden, Belknap & Swartz engine. It was erroneously stated in THE COMMERCIAL VEHICLE of Feb. 15 that these trucks, made by the Bethlehem Motors Corp., were not equipped with governors and that the smaller model used a Lycoming engine.

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New Jersey Increases Truck Fees

Bill Effective January 1, 1918 —Time for Protest Provided

TRENTON, N. J., March 24—Following in New York State's footsteps, New Jersey has to-day enacted into law a measure increasing the license fees of all commercial vehicles other than those equipped with pneumatic tires. The bill was based upon the findings of the engineering committee whose report was submitted to the legislature on Jan. 23, 1917. It was signed by Governor Edge and is to go into effect Jan. 1, 1918.

The schedule of license fees as set forth in the new bill is based upon the gross weight of vehicle and load and will replace the present method of charging an additional $10 to the fee provided under the present law and paid under a horsepower rating as follows:

Motor vehicles of 10 hp. or less....$4.50
Motor vehicles of 11-29 hp..... 7.50
Motor vehicles of 30 hp. or more..15.00

It is interesting to note by a study of the proposed schedule given below, that the new fees are practically the same as those now in force in New York State but that they are slightly less for the larger-capacity vehicles than the original recommendations of the New Jersey committee as submitted to the legislature on Jan. 23, 1917. The one fortunate feature of the New Jersey proposed fees as set forth in the law just passed is that such fees do not go into effect until Jan. 1, 1918, whereas those in New York are now in force, and owners have had to pay the increased fees in order to obtain their license plates and keep their vehicles on the road. The fact that the new fees will not go into effect before another 9 months will permit motor truck interests to protest against the largely increased fees, a condition which the owners in New York State were not so fortunate in obtaining, due to the fact that the bills in that State were railroaded through the legislature without sufficient time for protestation.

The new New Jersey fees and the comparison between them and those originally offered by the engineering committee and a comparison with the fees now in force in New York State are given below.

It is also provided that commercial vehicles not subject to a registration fee based upon the gross weight of the vehicle as outlined above will continue to be subject to a registration fee based upon horsepower at the rate previously given in this article. This means that a 2-ton motor truck equipped with pneumatic tires all around will pay a license fee according to the horsepower of its motor.

The law further provides that if any truck is registered after the first day of September of any year the fee required shall be but one-half of the registration fee as provided above.

PACKARD TRUCK SALES $4,000,000

DETROIT, March 18.—The Packard Motor Car Co. sold more than $4,000,000 worth of motor trucks in January and February. None of these were for foreign shipment.

NO MORE NILES TRUCKS

NILES, OHIO, March 22—The Niles Car & Mfg. Co. has decided to discontinue the manufacture of motor trucks. The bulk of the Niles business has been devoted to making cars for electric railways. It is possible that the company will manufacture self-propelled interurban cars.

6341 COMMERCIAL CARS IN CANADA

OTTAWA, Ontario, March 20—The figures from Nova Scotia, Ontario, Quebec, Alberta and British Columbia, which together registered 6341 commercial cars, make a total of 10,000 for the Dominion a safe estimate. It is interesting to note that the Pacific province has registered 2836 commercial cars, as compared with 2804 in Ontario and 900 in Quebec, but it is believed that this surprisingly large total may be credited to the fact that a large percentage of the registration is due to the development of the jitney bus, which has attained a much more permanent vogue in the West.

During the six months ending Sept. 30, 1916, 138 commercial cars entered the Dominion from the United States, with a valuation of $184,107.

Gross weight of vehicle including chassis, body and load	New Jersey truck fees to go into effect Jan. 1, 1918	New Jersey truck fees proposed by engineering committee	New York State truck fees now in force
4,000 lb. or less	$15.00	$15.00	$10.00
4,001 to 5,000	17.00	17.50	15 00
5,001 to 6,000	19.00	20 00	15.00
6,001 to 7,000	21.00	22.50	20.00
7,001 to 8,000	23.00	25 00	20 00
8,001 to 9,000	25.00	27.50	25.00
9,001 to 10,000	27.00	30.00	25.00
10,001 to 11,000	29 00	32.50	30 00
11,001 to 12,000	31.00	35.00	30.00
12,001 to 13,000	33 00	40.00	35.00
13,001 to 14,000	35.00	45.00	35.00
14,001 to 15,000	37.00	50.00	40 00
15,001 to 16,000	39.00	55 00	40 00
16,001 to 17,000	41.00	60.00	45.00
17,001 to 18,000	43.00	65 00	45.00
18 001 to 19,000	45.00	70.00	50.00
19,001 to 20,000	47.00	75.00	50 00
20,001 to 21,000	49.00	81.25	55 00
21,001 to 22,000	51.00	87.50	55 00
22,001 to 23,000	53 00	93.75	60 00
23,001 to 24,000	55.00	100 00	60.00
24,001 to 25,000	57.00	106 25	65 00
25,001 to 25,875	59.00	112.50	65.00

Boston Truck Interests Oppose Bill

Claim Reduction of 14-to 8-Ton Limit Would Block Mobilization

BOSTON, MASS., March 27—Boston motor truck interests are strongly opposed to the suggested change in the present law which would limit the weight of motor vehicles on state roads to 8 tons as against the 14 ton limit now in force. Chester I. Campbell, of the committee on public safety speaking before the legislative committee on roads and bridges at the State House this morning, argued that such a law would hinder the mobilization of the state's resources in any war emergency. Any military exemption permit which might be used in such case would involve the delay of red tape. The heavy trucks do no more harm to the roads than the faster and lighter vehicles, according to the testimony offered by many at the hearing.

S. A. E. READY FOR WAR

NEW YORK, March 28—In the event of war the Society of Automobile Engineers has prepared itself to be of service to the government. An effort is being made to secure at least several hundred new members during the next 30 days. On April 19 next, the name of the society will be changed to the Society of Automotive Engineers, widening its scope to include aeronautic and tractor engineers.

MOTOR TRUCK CANVASS IN MAINE

PORTLAND, Me., March 18.—Maine is canvassing its motor truck and motor car owners and drivers to see what service the State could render to the Government in time of war. The Maine Automobile Association is sending out a questionnaire to its members which asks if they would volunteer their services as ambulance, truck or staff car drivers; if they would volunteer the use of their motor vehicles, if they would turn the vehicles over to the Government at the prevailing market price.

U. S. TRUCKS FOR FRENCH FIRMS

CINCINNATI, OHIO, March 18—The United States Motor Truck Co. is starting delivery this month of twenty 5-ton trucks monthly to French business concerns whose vehicles were commandeered for war purposes by the French Government. The contract came through J. P. Morgan & Co.

OVERLAND TRUCKS COST $30 MORE

TOLEDO, Ohio, March 28.—The Overland light delivery vehicles have been raised $30 in price. The panel type now sells for $730, formerly $700, and the express model is now $705, formerly $675.

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200 Ford Adapters in Boston

New England Businessmen Giving Converters Thorough Trial

BOSTON, MASS., March 18.—The New England businessman is giving the various forms of adapters for converting Ford cars and other makes of passenger vehicles into trucks a most thorough trial. At the present time it is estimated that there are more than 200 of such converted vehicles actually in use within the limits of the city and that there are perhaps 800 to 1000 more in service within a 40-mile radius of the city center.

The low price of such vehicles is undoubtedly one of the chief reasons why so many of them have gone into service within the past year. Most of the outfits have been purchased by small merchants who heretofore have used horses for delivery purposes exclusively. Due to the generally increased prosperity throughout the New England territory during 1916, many such merchants have decided to install their first motor equipment. Knowing the excellent reputation of the Ford in ordinary passenger car service or in delivery service with loads not in excess of 800 lb. and taking into consideration the low cost of the combined vehicle they have decided to test out one of the six or seven makes of such adapters which are now actively on the market in the Boston territory.

Besides the small merchants who have installed adapted passenger car vehicles during the past year many concerns which previously used conventional motor trucks have also purchased one of the various types of converters. Among the latter are the Walworth Mfg. Co., and the United Grocers Wholesale Co., the former, a machinery and castings house and the latter a grocery company delivering to a large number of retail stores within the Boston Metropolitan district. The Boston Baked Bean Co. also operates a fleet of three converted vehicles which were run without interruption during the recent snowstorm that threatened to tie up traffic in the city during the week of the Boston truck show.

Several of the Boston department stores have also purchased similar vehicles during 1916 and are employing them with enlarged bodies for the delivery of bulky packages. Plumbers, painters, fish dealers, hardwaremen, miscellaneous manufacturers, coal dealers, contractors, laundrymen and confectioners, etc., have also purchased fleets of one to a half dozen or more.

Most of these adapted passenger cars have been in service less than 2 years, so that the contention by some that the Ford motor is not rugged enough to withstand the strains imposed by having to pull more than double the capacity load for which it was intended, cannot be completely answered at this time. The fact that the gear reduction has been increased in most of the adapter models offered on the market in order to reduce the speed and increase the pulling power, seems to have enabled the Ford motors to stand up under the greater loads carried. It must be remembered in this connection that with the greater gear reduction the motor actually turns over more times while the vehicle is covering any given distance than with the original reduction of the unchanged Ford. Against the contention of some that the additional strain placed upon the passenger car chassis would cause it to disintegrate or shake to pieces prematurely, some of the owners of adapted vehicles maintain that it will be cheaper to discard such broken-down vehicles when they are no longer fit for service than it would be to purchase higher-priced trucks of the conventional type.

Be this as it may, the facts of the case are that several Ford adapter makers including the Smith, Hudford, Tonford, Longford, Maxfer, Redden and others have entered the Boston market and established service stations.

While the Ford company will revoke the guarantee on the parts of its car should the latter be combined with any form of attachment and while it also would seek to prohibit the sale of its chassis to those intending to fit converting attachments, there seems to be no difficulty in obtaining a sufficient number.

FILE BANKRUPTCY PETITION AGAINST R. E. TAYLOR CORP.

NEW YORK, March 29—A petition in bankruptcy has been filed against the R. E. Taylor Corp., distributer of Gramm-Bernstein trucks, by Joseph Naples & Bros., creditor for $707. Preferential payments of about $1,000 are alleged. A creditors' meeting is scheduled for 11 a. m. to-morrow in the offices of Hedges, Frankel & Ely when a statement of the corporations finances will be made.

WHITE EQUIPMENT NOT KINNEY

The combination road-oiler, sprinkler and flusher described and illustrated on page 36 of the March 1 issue of THE COMMERCIAL VEHICLE was erroneously termed the White-Kinney equipment, whereas it should have been stated that the outfit as mounted on a White 5-ton chassis was built entirely by the White Co., Cleveland, Ohio, which has patents on the heating system employed in the equipment. This error was due to the apparent great similarity in the two outfits and to the fact that several White trucks had previously been fitted with Kinney equipment made by Kinney Mfg. Co., Boston, Mass.

Be A Field Editor for THE COMMERCIAL VEHICLE Pages 10 and 11 Tell How

Propose Trailer Tax in New York

Bill Would Add to Present Truck Fees—Sound Objections

NEW YORK, March 27—More taxes are contemplated for commercial vehicle owners in New York. The latest step in this direction is a bill, which has been referred to the committee on internal affairs, to tax trailers.

Several sharp criticisms of the measure are made by motor truck men. The bill means added taxation on the commercial vehicle which carries a trailer. The present tax is estimated on the basis of the total weight of the vehicle. It is therefore already taxed once for carrying a trailer, hence this measure would mean a double tax.

The bill makes no distinction between the trailer and semi-trailer. Furthermore, no discrimination is made with regard to the type of tires used, whether iron or rubber, narrow or wide. Hence the bill is regarded by its opponents as class taxation, and not scientifically based on the wear and tear of the roads.

This legislation comes properly within the jurisdiction of the new Truck Commission Committee to be appointed by Governor Whitman, and it is believed that such a bill should not be passed until referred to the committee directly appointed for such affairs. The gist of the bill follows:

PROPOSED TRAILER FEES.

Combined weight and capacity	Fee
4,000 lb. or less	$5.00
10,000 lb. or less	10.00
14,000 lb. or less	15.00
20,000 lb. or less	20.00
28,000 lb. or less	30.00
Over 28,000 lb., $30.00 and $5.00 for each excess ton.	

N. Y. TRUCK FEES BOOST RECEIPTS

ALBANY, N. Y., March 18—Motor vehicle tax receipts are expected this year to pass the $4,000,000 mark due to the increased commercial vehicle fees and the larger number of motor cars. Motor truck fees paid to the Secretary of State in February amounted to $497,442.

LOS ANGELES DEALERS FEDERATE

LOS ANGELES, CAL., March 23—Los Angeles motor car dealers have decided to admit motor truck men to the Motor Car Dealers Assn. in order that the motor vehicle industry may present a united front in fighting the proposed limitations on motor trucks now before the state legislature.

STUDEBAKER SALES FORCE MEETS

SOUTH BEND, IND., March 26—Studebaker salesmen from all parts of the United States except the Southern territory held their annual convention at the home office of the Studebaker Corp. last week.

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The Mexican idea of a road. The wonder is not that the trucks got as far as they did so much as that men would deliberately drive them there. A White and two F.W.D.s decidedly in bad



No one can blame the truck in such a mess



This is what is meant by a bottomless road

Quartermaster Praises Army Truck Work

U.S.A. Trucks Equal to Worst War Transport Job in World

WASHINGTON, D. C., March 16—In view of the splendid performance of motor trucks on the border during the past few months the annual report of Gen. Henry G. Sharpe, quartermaster general of the army, in which he reviews in great detail the activities of the department in motor transportation, is of more than passing interest. Gen. Sharpe says the first motor truck for carrying supplies was procured by the quartermaster's department in June, 1907, since which time the department has made constant progress in developing the motor truck as a means of transportation. Appropriations for this purpose, until recently, have been very limited. The progress of development, however, considering these circumstances, has been very satisfactory.

Motorization Began in 1911

The quartermaster's department first took up the matter of operating trucks seriously in 1911, and extensive experiments and observations have been made annually since that time. Near the close of the fiscal year 1916, however, extensive opportunities were afforded for determining the value of motor transportation under severe conditions in connection with the operations in Mexico and along the Mexican frontier.

The first specifications of the quartermaster's corps were written in 1913, after extensive correspondence with manufacturers and the Society of Automobile Engineers. These specifications have been revised and brought up to date annually. The revision of 1916 was carefully prepared in consultation with the S. A. E., which has given the department valuable and much-appreciated assistance in solving the problems of motor transportation. In this connection, says the report, it may be stated that it is very difficult for motor truck manufacturers to immediately effect changes to conform to the requirements of military trucks, for the reason that orders for materials are placed many months in advance of the time when it is required to enter into the manufacture of trucks.

During the early part of the fiscal year 1916 motor transportation was confined to operation of motor trucks in connection with the transportation of supplies between base depots and outlying camps on the Mexican border, in connection with the operation of quartermaster corps depots, and at a few posts in the United States and oversea possessions where motor transportation could be installed at a saving over animal-drawn transportation. By careful observations and such experiments as could be undertaken with the limited funds appropriated for procurement of motor transportation experience of great value was obtained, demonstrating that motor transportation can be relied upon under severe road conditions.

Tentative organizations and regulations for all motor units, repair shops, and subsidiaries were prepared in the office of the quartermaster general and distributed to those charged with handling these units, so that necessary steps were taken, so far as was possible under the new regulations.

Mobilizing Motor Trucks

When instructions were given for the organization of an adequate force of troops to cross the Mexican border, the quartermaster's department was in position to take immediate steps to procure necessary motor transportation which it was foreseen would be required. On March 11, 1916, the first call was received from the southern department for two motor truck companies, consisting of twenty-seven motor trucks each, of 1½ tons capacity, equipped with necessary personnel for their operation. As soon as the approval of the secretary of war was received these trucks were purchased and provided with the necessary personnel, hired at the factories at which the trucks were manufactured.

The report then goes on the tell of the departure of these two truck companies and after mention of the fact that motorcycles were found unsatisfactory in connection with the truck companies, light cars of the roadster type were substituted and have been found more satisfactory.

One of the most important features in connection with the operation of motor trucks, says the report, is that they are

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equipped with a strong and suitable body. While the heavy body provided for in the specifications of the department adds materially to the weight of the truck, it more than makes up by its longevity and carrying capacity.

Experience Great Teacher

As the experience of the department becomes more extensive in the operation of motor trucks under the extremely severe conditions to be found in the operations in Mexico, many defects developed in some of the trucks in use; others of a much more serious character. In general, however, it may be stated that the provisions of the specifications were found to be based on correct principles for the service for which these trucks were intended.

Army Aided by Truck Makers

The department says it has been greatly assisted by representatives of various truck manufacturers in the study of defects and recommendations for improvement in the motor transportation now in operation. By the end of the fiscal year ten motor truck companies, each consisting of twenty-seven motor trucks of 1½-ton capacity, six motor truck companies consisting of twenty-eight trucks of 3-ton capacity, and two motor truck companies each consisting of thirty-three trucks of 3-ton capacity had been purchased and were in operation along the Mexican border.

At the time the report was written about $2,175,670 was expended in motor trucks, equipment and repairs, since which time the amount for motor truck transportation has increased considerably.

All Trucks Thoroughly Tested

The commanding general, southern department, states that "All motor truck manufacturers agree, with exception, that their service on our line of communication from Columbus, N. Mex., south into Mexico was the hardest test of motor truck transportation they have ever known, and no make of truck was purchased for this service that was not first tested out on our line of communications and recommended as satisfactory by officers who actually tested out these machines on the line."

In this way it is believed that the government has secured the best makes of motor trucks for this severe class of service that can be procured in this country. Motor truck manufacturers have expressed themselves as being well pleased to have been afforded an opportunity of testing out their trucks, even in cases where trucks have not proven satisfactory for the service, inasmuch as it discloses the nature of the weaknesses of such truck and led manufacturers to modify and improve their trucks for this class of service.

The commanding general, southern department, reports that the approximate cost of operation of trucks per ton-mile is $0.70, which includes all incidentals, such as upkeep of repair shops, etc.

Speed Greatest Menace

Among officers of experience with motor trucks it is believed that speed is the greatest menace to the successful operation of trucks. It is the hardest thing to control and causes more expense than all other things combined in connection with motor trucks. Many officers of the army are now getting valuable experience and gaining a considerable knowledge of motor truck transportation, and no doubt in the future will be able to handle such problems better than they have in the past, and all of them realize that care is essential in the handling of this class of transportation.

A study of the tabular matter at the back of the report shows some very interesting results of the experience of the army as an operator of commercial vehicles. There is one table of data concerning 166 trucks on hand in the United States except the Philippines, the oldest 5 years 8 months old and the newest 1 month old. The table shows the following data—which here is given in per cent or averages—for each individual truck, and should prove of great value to the army. Summarized it yields the following:

Average miles run, fiscal year	3933
Average tons hauled	636
Average tons hauled 1 mile	3656
Average cost of operation, exclusive of tires, fixed charges and driver's wages	$346
Average cost of tires	$68
Average wages of driver, including rations and clothing	$347
Average time laid up	1 mo. 5 days
Average cost per ton-mile exclusive of tires, fixed charges and driver's wages	9.46 cents
Average length of haul	5¼ miles
Condition at end of year:	
Good	32 per cent
Fair	9 per cent
Serviceable	19 per cent
Poor	36 per cent
Unserviceable	4 per cent

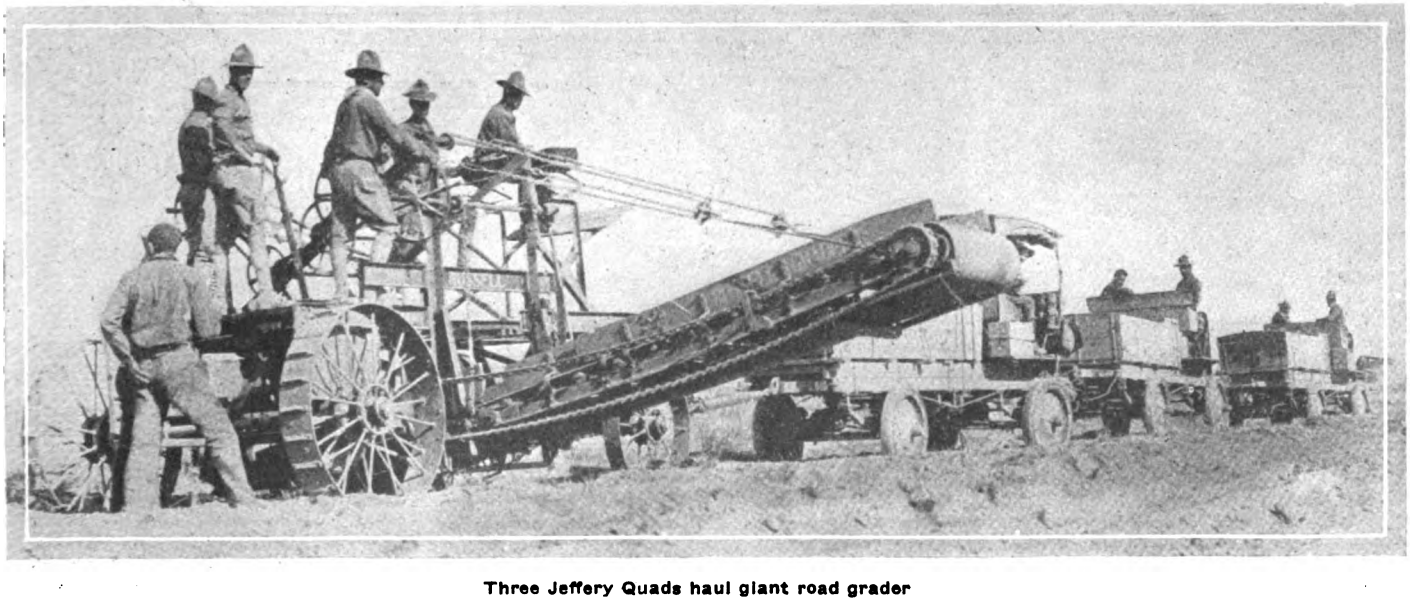
In the account of trucks purchased during the fiscal year it is found that the purchases by the Quartermaster Department of the army in the fiscal year totalled 573 transport trucks, fifty-eight tank trucks, twelve machine shop trucks and six wrecking or repair trucks. These represented the following makes in the quantities shown.

Denby	1	Kelly-Springfield	10
Federal	3	Packard	123
F. W. D.	81	Peerless	92
Garford	1	Reo	4
G. M. C.	2	Republic	2
Jeffery	146	Riker	67
		White	117

A stirring incident attending the mobilization of these fleets of trucks is related which, while already recounted in these columns, several months ago, still is worthy of recollection as illustrating how motor truck manufacturers were able to make up for the regrettable and abject unpreparedness of the War Department to meet the emergency which arose. It is told in the words of the Quartermaster General as follows:

"Bids were invited for a number of trucks and awards made about 5 o'clock in the evening of March 14. Twenty-seven trucks were purchased under this advertisement in Wisconsin. These trucks were inspected, the personnel to operate them employed, the trucks were loaded in fourteen cars and tourist cars furnished for the personnel, and the train left at 3:11 a. m., March 16. It arrived at Columbus, N. M., 1591 miles away, shortly after noon on the 18th, the trucks were unloaded from the cars, loaded with supplies and sent across the border, reaching Gen. Pershing's command with

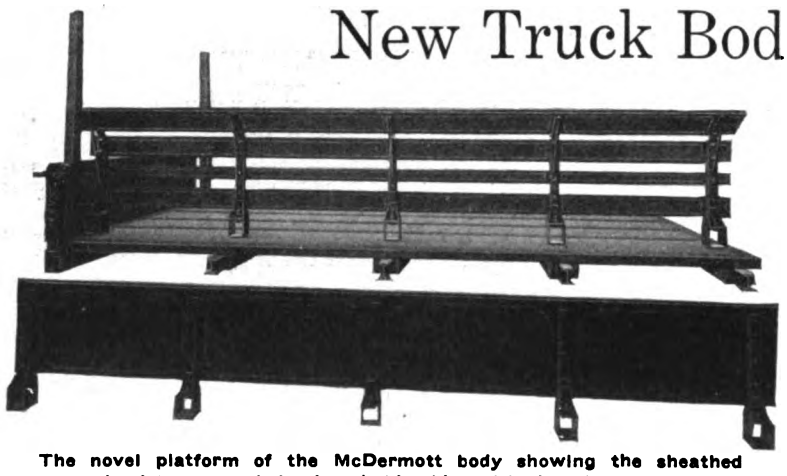
(*Continued on page* 28.)



Three Jeffery Quads haul giant road grader

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New Truck Bodies Seen at the Shows



The novel platform of the McDermott body showing the sheathed crosswise I-beams and the detachable sides with side standards having rectangular sockets at the bottom by means of which the side members can be removed in a few moments time and replaced by other designs offered as stock equipment. The flareboard slatted side and the low-sided panel types are shown. Others include a side-staked design and even a moving van unit

McDermott New Type with Unusual Platform and Detachable Sides

Others Bring Out Ideas for Greater Convenience and Efficiency

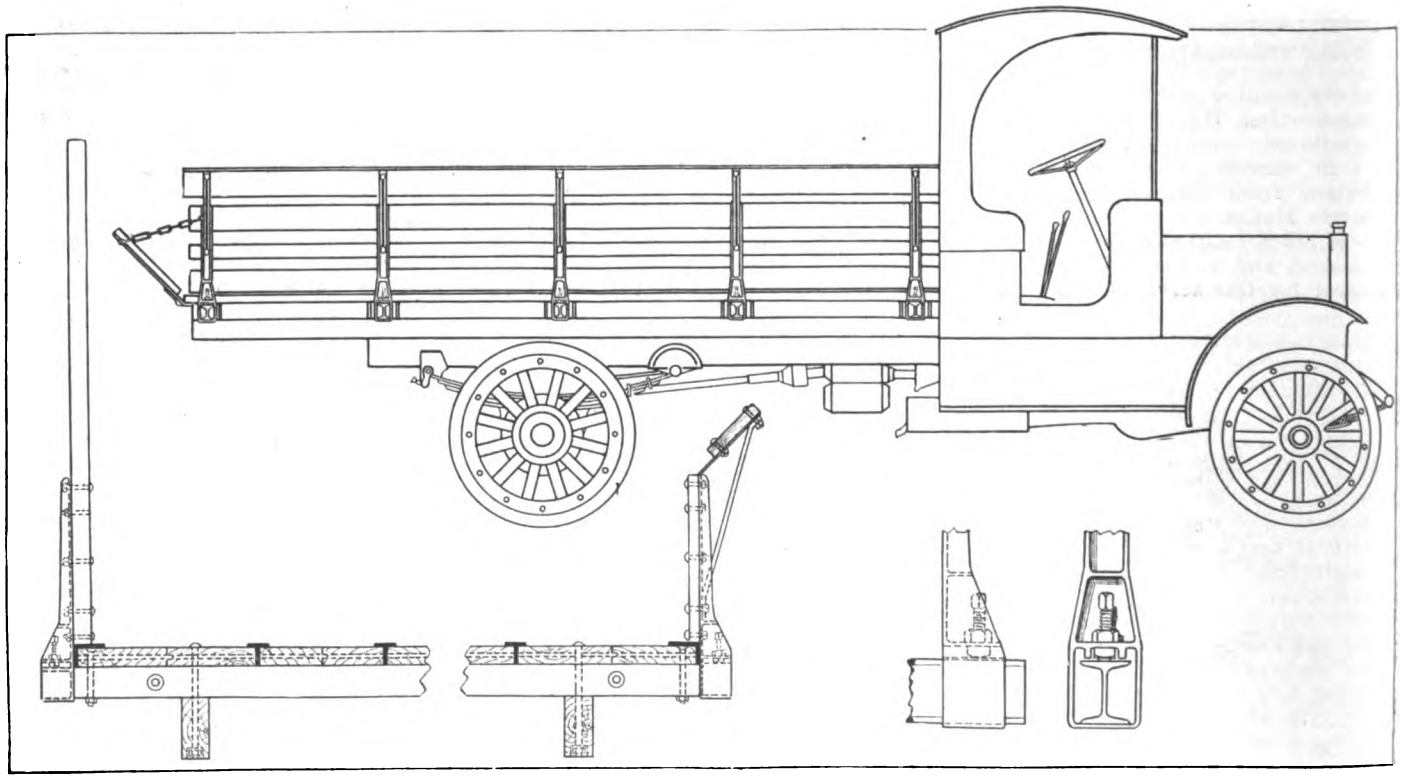
SPECIAL motor truck bodies did not play as important a part at the Boston and Brooklyn shows, described in the last issue of THE COMMERCIAL VEHICLE, as they did at last year's exhibitions in the same cities.

Brooklyn Show Hurried

Bodies were not a prominent feature of the Brooklyn show, for most of the exhibits were gotten together too hurriedly to permit of their preparation. There were several interesting ones, however, representing for the most part the regular run of bodies constantly being furnished.

In Boston, seventy-four of the 121 vehicles on the floor were equipped with bodies as against eighty out of a total of 120 trucks exhibited in 1916. The reason for the decreased number of chassis shown with bodies was that there were nineteen makes of trucks shown to the New England public for the first time. The exhibitors of these vehicles entered chassis rather than complete jobs because the prospective purchaser is much better able to inspect the minute details of the chassis construction if it has no body covering up the gearset, propeller shaft, rear axle and brake mechanism as seen from the top.

Notwithstanding the lack of prominence of the body exhibits at both the shows, there was one brand new type of body at each gathering. At Boston, the novel advertising body mounted on a 1½-ton White to be used on the streets of Boston for 10-hour stretches was the center of interest. In addition, there were several of the conventional New England furniture bodies with low sides



Profile and details of the new McDermott body with detachable sides, showing the construction of the platform floor, two types of sides and the manner in which the side bar stanchions are secured to the I-beams of the platform by means of rectangular sockets and set screws with locking nuts. Note also the angle armor around the top edges of the platform and the manner in which T-beams are inserted between the tongue-and-groove timbers forming the floor. The T-beams strengthen the platform and besides provide permanent wearing strips with no sharp edges as is often the case where thin plates screwed into the floor are used. A body of this type enables the truck owner to change bodies easily and quickly to best suit his particular work

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and semicircular bow tops covered by tarpaulins. One 5-ton White with such a body was fitted with longitudinal seats on each side and a center seat for passengers sitting back to back, making four longitudinal rows. With such an arrangement, between thirty and forty people could be carried, as on picnics, although the legroom was somewhat restricted.

The newest body at the Brooklyn show was the McDermott, made by the McDermott Body Corp., Long Island City, N. Y. This body, illustrated on the opposite page, is characterized by its detachable sides, which can be knocked down and boxed in cases of small volume for shipment to distant points; by the method of easy attachment and removal of the sides to and from the platform, and by the method of the construction of the platform itself.

Standardized Units Used

In short, the McDermott body consists of a standard platform built on crosswise I-beams which extend out beyond the edges of the platform proper on both sides. The detachable sides, which are offered in several designs, are provided with side bars having rectangular sockets at the bottoms which are slipped over the corresponding extended ends of the cross I-beams and held rigidly in place by means of set screws and locking nuts, as shown in the detailed view in the illustration at the bottom of the opposite page.

The side sections are offered in low-panel sides; straight slat sides; slatted sides with angular or right-angled flareboards and even in high moving van sides, joined at the top with a conventional canvas-covered roof. By means of these various units it is possible to change the body from a pure platform type to several other designs in from 10 to 20 minutes, the assembling taking from 10 to 15 minutes and the knocking down about 5 minutes.

The side bars used in the low-sided types of either the panel or slat forms are standardized and simply have added to them small arms for converting such types into flareboard designs.

The Platform Construction

The construction of the platform proper differs from the conventional in that instead of thin strips of metal nailed to the floor for producing better wearing qualities it has T-beams whose vertical arms are inserted between the longitudinal tongue-and-grooved members which make up the floor. This construction eliminates the possibility of the flat pieces becoming loose and tearing goods; of the quick wear of the thin strips, and besides adds greatly to the strength of the platform, which is further armored by means of an angle iron placed over the corners on both sides and ends. The T-irons and tongue-and-grooved planks are held together by means of crosswise bolts running clear through from one side to the other. The platform is carried on two wood stringers on top of the chassis frame and held

Your Best Truck Repair Job

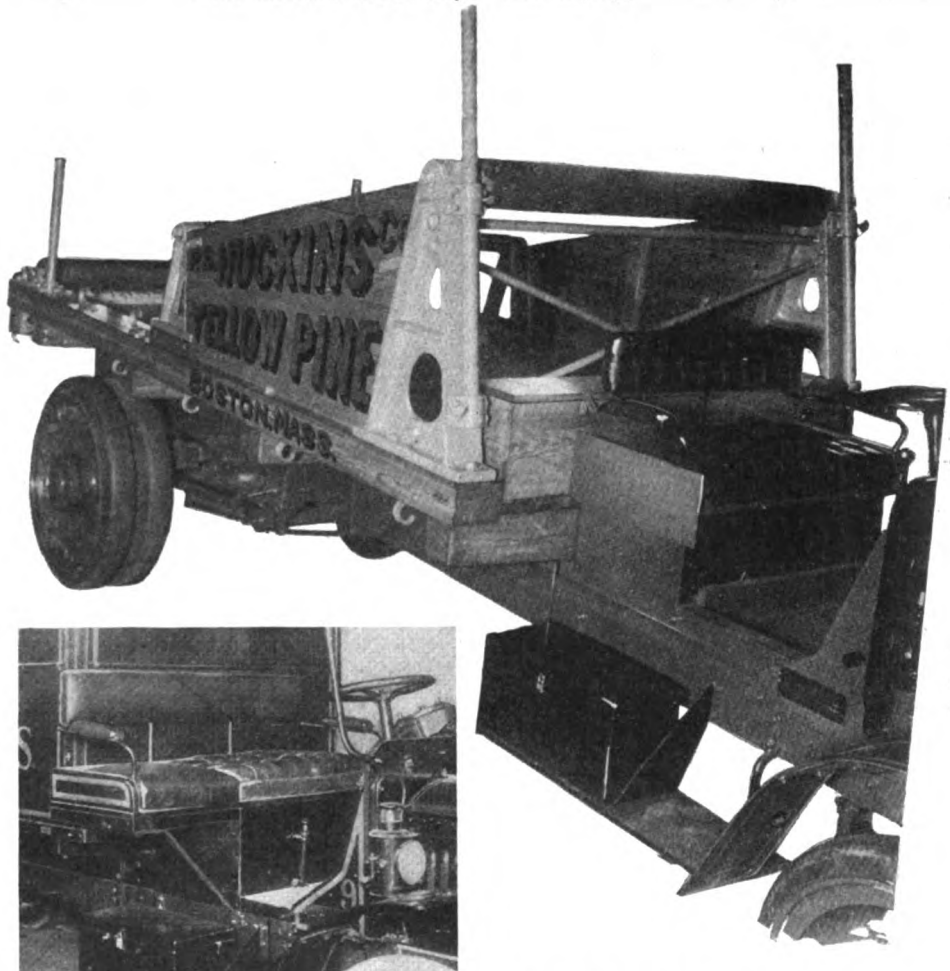
See pages 10 and 11

in place by vertical bolts clear through the stringers. The crosswise I-beams are armored with wood on both sides and are held in correct longitudinal relation with one another by means of long bolts from the front to the rear members.

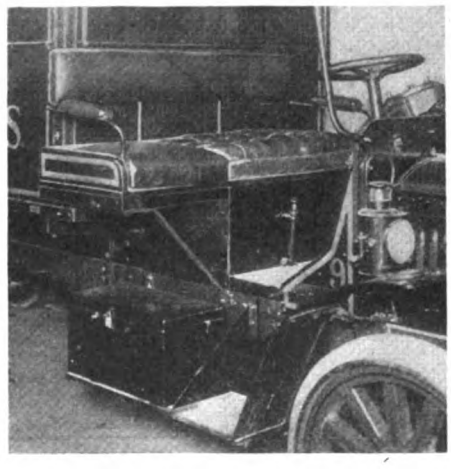
No Blacksmithing Necessary

The platforms and various side members offered are manufactured complete in the McDermott factory. There is no blacksmithing anywhere on the entire body, whose parts are assembled and then knocked down for shipment. The knocked-down feature of the type is especially advantageous for shipping because of the small volume of space in a freight car that the knocked-down body occupies, as compared with a body shipped assembled and ready to mount on the truck chassis. For instance, a standard slat-sided body when assembled occupies a volume of 11 cu. yd., and when knocked down, only 2.4 cu. yd., being boxed in a container 12 ft. 4 in. long, 5 ft. 4 in. wide and 1 ft. deep. The weight of such a body complete is 1,000 pounds.

In another body seen at the Brooklyn show, provision was made for long-distance hauling of furniture and household goods, in one instance, by which the usual large crew of men necessary to handle the goods without excessive delay could be transported in comfort even on long winter drives. This was on a 2-ton Signal sold to L. Curth & Sons, Brooklyn. The body was the usual type of closed padded van, carrying an integral cab in front. This cab was the full width of the body, about 7 feet, and had a substantial flanged roof. The sides were closed except for the door space, and there was a wide windshield across the front. This windshield was in two sections, upper and lower, and three ver-

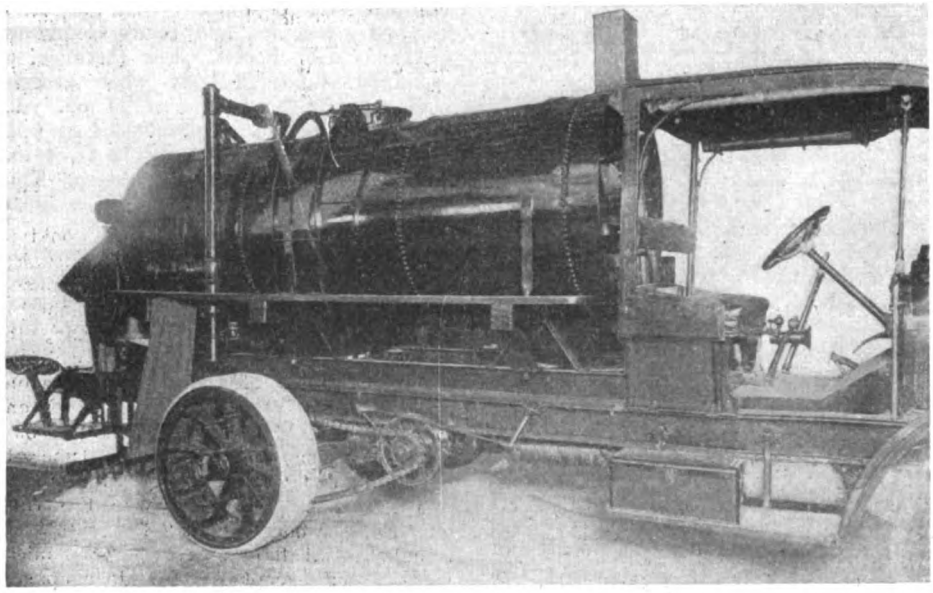


Unique in that it associates the truck with the product of its owner, the 6-ton Packard shown above is equipped with a somewhat common type of lumber body but which is made of unpainted yellow pine, the same material in which its owner deals and which it carries. By this method its owner is able to derive a considerable amount of advertising value which could not be secured were it painted with some common color as is usually the case



The side cushion mounted on two side brackets as shown on the 2-ton Packard moving van illustrated above provides a comfortable seat for the third man who is always sent with van loads of furniture delivered in the New England territory

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The patent White combination road-oiler, sprinkler and flusher recently brought out by the White company. It is built as a unit and mounted on a special subframe by means of which the entire outfit may be removed from the truck when it is desired to use the vehicle for other purposes during the winter months when road construction work is shut down. The outfit is shown mounted on a 5-ton White truck as exhibited at the Boston show

tical panels. The panel opposite the driver was provided with a swinging window which could be opened and turned to an angle such as to give rain vision; that is, a clear view of the road with protection against rain. The floor on either side of the dash is extended and there is room on the seat for four persons.

Two Estate Bodies Shown

There were two estate bodies on view, one on a ¾-ton White and another on a Ford chassis. The body on the White was completed in natural hard wood with a high finish. It had two longitudinal seats arranged to fold out of the way to haul baggage. The upholstery was in brown leather and the tailboard was arranged to fold down, affording easy ingress and egress by means of a folding step. The entire vehicle was trimmed in nickel instead of brass or black enamel, to give it a country atmosphere.

The Ford estate car was similarly finished in natural wood, although not so highly finished as its more expensive prototype. Its seats were transverse and three in number, each capable of seating three in a pinch. There were doors at the sides to each of the two front seats, and the middle seat had a hinged section to afford access to the back seat. The two rear seats were detachable so that both passengers and baggage might be carried at once.

At the Republic stand was an interesting panel type made of metal on a wood frame. Unlike most panel delivery bodies—this was on a 1-ton chassis—there was no molding around the waist of the body, but the entire surface was clear from floor to eaves, thereby adapting it admirably to any scheme of decoration desired. For sign work on either side, it offered unrestricted latitude.

Of local interest was a Long Island farm body on a 3½-ton Velie chassis, built for J. W. Hoffman, New Hyde Park, Long Island, N. Y. The construction of the horse-drawn wagon bodies was faithfully carried out in this job, the main section being slightly flaring outward as it rose to a decided step at the top. This step extended around the body in the form of an overhanging gallery with a rim about it, this permitting the carrying of a large load of light produce, such as baskets of fruit, etc.

Your Best Truck Repairs

See pages 10 and 11

It was made of wood with an intricate grilled framing on the exterior and was even lettered with the name of its owner in the time-honored style used on Long Island produce bodies.

Other bodies which attracted attention at the Boston show included a conventional type of lumber body on a 6-ton Packard owned by the P. S. Huckins Co., Boston, Mass.,. dealers in yellow pine. As shown on page 19, that body had a trapezoidal wood filler piece on each side between the front and middle uprights, carrying crosswise rollers by means of which long lengths of lumber could be carried, extending forward over the driver's head. The main feature of the body was that the wood filler piece on each side was made of yellow pine and finished in its natural color instead of being painted, in this way associating the truck with the product which its owner sells.

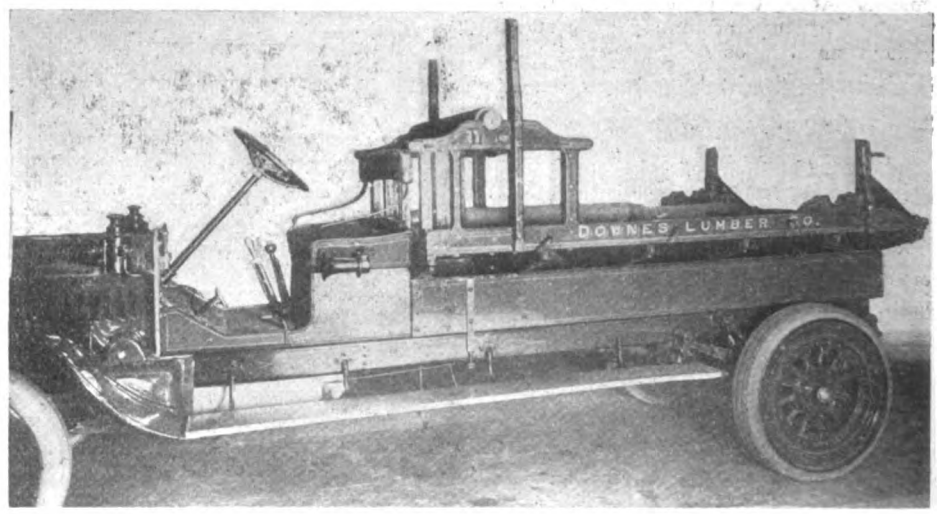
Novel Moving Van Seat

Another body detail seen at the Boston show was a third seat at one end of the conventional driver's seat on a 2-ton Packard with a van body owned by Berry & Tibbetts, movers, of Boston. This seat was for the third man of the crew usually furnished with vans. It extended slightly beyond the edge of the van on the right side and was held in place by a simple bracket at the front and by resting it on the ledge of the van bottom at the rear.

Buses Promote Higher Learning

(*Continued from page 7*)

ten to glorify Fullerton. The idea is to emphasize by the account of Fullerton's achievement how lacking other communities are which have not had Fullerton foresight, nimble-mindedness and ability to see the essentials and plan scientifically. They can learn that the idea is



Mounted especially high on 16-inch wood stringers placed longitudinally along the tops of the side frame members, the otherwise conventional lumber body on the 1½-ton White shown above is able to carry 20- to 25-foot lengths of lumber and to deposit them in one pile on the ground by means of the three wood-covered rollers shown. The purpose of the high stringers is to permit the load to be deposited in a symmetrical pile, flush at both sides and ends, rather than being strung out in layers much like a flight of steps

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sound, and base their own gain in educational efficiency on what Fullerton has demonstrated to be the correct principle, namely a large and truly efficient central plant and instructing staff of competent specialists, made accessible to the entire community within an hour's ride by the use of improved highways and modern motor bus transportation.

The officials of the Fullerton Union High School and Junior College are:

Edward W. Hauck, A.M., Ph.D., principal; Board of Trustees, L. B. Steward, president, O. A. Kreighbaum, clerk, W. J. Travers, W. L. Hale, M. M. Good.

Trucks Will Aid Tropics

(*Continued from page* 12.)

Recuperation will be rapid. The net gain of population in Europe before the war was about 5,000,000 a year. Granting that there have been casualties of 4,500,000 to date, this still leaves the various countries gaining in population, so that at the conclusion of the war there will be more people in Europe than ever before. Probably half of these will be males, and thus likely to enter industrial pursuits. Furthermore, the training of women in war time has created a new industrial army.

Estimates of the loss in world's tonnage show that the net decrease is probably not more than 5 per cent. The sitmulus to the shipbuilding industry in all countries indicates that this dearth will not exist long after the war. The loss of tonnage is being shared by all countries, and therefore no one nation will emerge with an advantage.

Trade Conditions Will Be Resumed

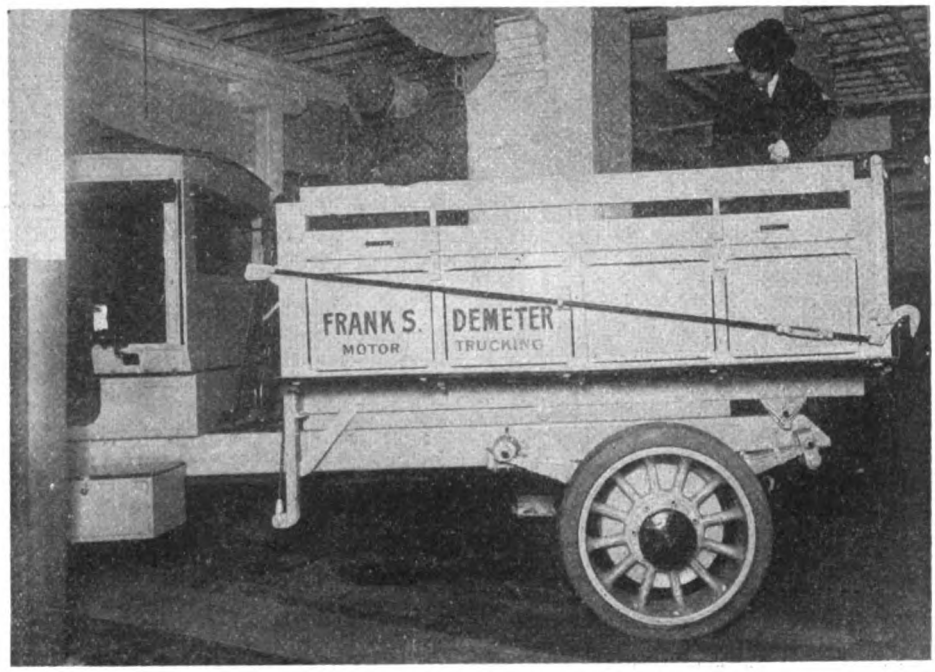
Bearing these facts in mind, that European trade relations are likely to be resumed, that the industrial working force of the belligerents will be greater than in 1914, that no nation will have more of a shipping advantage than it had before, it will be seen that the United States cannot depend on fortuitous circumstances to win trade for her after the war.

There are factors, however, which will handicap Europe. The amount of capital available for the belligerents when peace comes will be materially reduced. Their capital must earn a higher rate of interest than before. All sources of income will be heavily taxed to pay the war debts of the various countries, which now amount to $85,000,000,000. Against these obstacles for Europe must be placed the high cost of raw materials and labor in America, brought about by the war. The price of materials may be lowered, but the reduction of wages will be difficult.

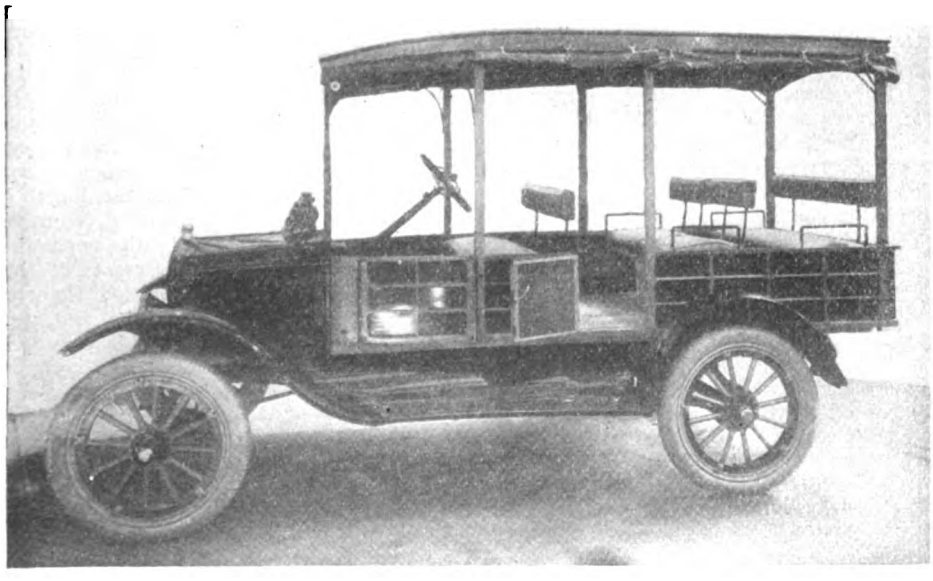
America's Hope Is Manufactures

America's hope for her export trade lies in her manufactures and in keeping the markets she has obtained in the neutral countries. Our exports to the neutral countries of Europe jumped from $242,000,000 in 1913 to $402,000,000 in 1916; to South America from $147,000,000 in 1913 to $220,000,000 in 1916; to Asia from $126,000,000 to $205,000,000, exclusive of that going to Vladivostock for transmission to European Russia; to Africa, an increase from $29,000,000 to $54,000,000; to Oceania, from $82,000,000 to $106,000,000, and to North America from $601,000,000 to $925,000,000. The total gain in the past 3 years in exports to neutral countries has been therefore $685,000,000 or 62 per cent greater than that of the 3 years ending with 1913.

This gain has been chiefly in manufactures. For a short time after the war Europe will also want our manufactured products. After that period there will be real difficulty in keeping the trade from the European competitor. In the past the great export trade of the United States has been in raw materials and food products. The population of the country is now absorbing its food supply, and there is a tremendously increasing consumption of cotton in the United States.



A Gramm-Bernstein 6-tonner, exhibited for the first time in the New England territory by the R. E. Taylor Corp., and fitted with a wood dump body equipped with especially neat two-part removable top boards to increase the cubical capacity of the body from 5 to 6¼ yards. The 5-yard body is used to carry coal, sand, etc., and the sideboards employed to give the rated 6-ton carrying capacity when cinders and the like are to be transported



One of the two country estate bodies exhibited at the Brooklyn show. That pictured above is mounted on a Ford chassis and is finished in natural wood to give it a country atmosphere. It has three crosswise seats, each sufficient for three passengers in a pinch. The front seat is reached through cab doors on both sides while the center seat is accessible through a hinged section as shown. The rear seats are removable so that baggage may be carried at the same time with passengers

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Our London Letter

By R. Douglas-Vickers

ENGLISH BUILDERS URGE TARIFF—FARM TRACTORS MUST BURN KEROSENE—BRITISH TRUCKS FAIL IN SEVERE RUSSIAN TRIALS

LONDON, ENG., Feb. 17—An important development in motor trade politics during the last few days is the formulation of their wants in a definite policy on the part of the manufacturing interests. It is said that "Man wants but little here below, nor wants that little long," and it remains to be seen how many of their wants will be achieved by the members of the Assn. of British Motor and Allied Manufacturers.

That body has, it is well-known, been actively engaged behind the scenes in carrying on a propaganda in favor of a tariff on all important motor vehicles, including those to be used for commercial purposes. They have now come out into the open, not altogether of their own free will, I think, but because of some statements that have already appeared in the press as to the objects of this body.

The document before me sets out at some length a number of the circumstances which the association considers jeopardize for the future of the British industry. In the forefront is placed the expectation that the markets will be flooded at the termination of the war by very large numbers of motor vehicles now in military or naval service. This, it is urged, will place a great difficulty on manufacturers as regards their output of new machines. Another factor which they regard as making for difficult times is the special war taxation. It is believed that this will result in a shortage of liquid assets available for the extension of business, the development of new markets and the organization of sales.

Factories All Expanded

It is also held that the difficulty of disposing of full outputs after the war will be aggravated by the fact that motor manufacturers have, in the execution of government contracts, extended their premises and purchased large quantities of new material and machinery which, it is stated, will have to be supplemented by the purchase of further machinery to make it productive for motor manufacturing purposes. For this reason the association considers it to be essential that markets at home and abroad should be widened as far as possible. All this is, of course, not without some proportion of justification, but when the association comes to the alleged loss of good will it becomes much more difficult to follow its arguments. They say that while the British motor industry has been fully engaged on government work a great deal of its good will has passed into the hands of foreign competitors. Nearly all of the firms so employed have, it is pointed out, had to relinquish some partly and some totally the manufacture of motor cars. We are told that such firms—we are not told who or how many they number—will not be in a position to resume their normal business until they have had time to reorganize their works at the end of the war, and that during this period of re-establishment British manufacturers will require adequate protection against the flooding of their markets by foreign competitors at home and abroad.

Outputs All Boosted

It may here be pointed out that all the commercial vehicle firms with but one exception have been continued at their normal occupation, though with a greatly increased output. There can therefore be no serious case made out on the basis of lost good will. The exception I have noted had not really made any headway as a serious commercial vehicle factory, as it was also engaged in passenger car production. It will thus be seen that any claims which may be put forward on this count from or on behalf of commercial vehicle builders can scarcely be sustained.

In order to regain this lost good will it is held that adequate legislative safeguards must be forthcoming, and these legislative safeguards mean import duties of 33⅓ per cent or more. To quote the association's memorandum of policy:

"We consider that British manufacfacturers should be assisted to compete with foreigners by temporary or permanent import duties not less than those hitherto imposed upon corresponding British products by foreign countries. The scheme of tariffs should provide for preference to the Allied nations, and a prohibitive tariff or temporary total prohibition should apply to goods of enemy origin, pending the adoption of a complete system of import duties, temporary substantial duties should be made applicable to all imported vehicles, their parts and accessories, so that when the present prohibition of imports ceases no free import will be permissible. Import duties imposed with a view of strengthening British industries after the war should operate for at least 5 years, and should apply to all components and accessories as well as to complete vehicles or chassis."

The dumping of foreign goods is to be checked by the application of *ad valorem* duties; any difference in the invoice values and what is described as the home consumption value is to be collected as a surtax. It is further suggested that if the present system of preferential tariffs for British goods entering the self-governing dominions is perpetuated, the conditions should be revised so as to distinguish clearly between goods genuinely of British manufacture and goods merely assembled on British territory; the former, it is urged, should be given a higher scale of preference and the conditions applying to all the oversea dominions should be identical.

In order to get over the dangers arising from the influx of large numbers of war-worn vehicles, the proposal is put forward that vehicles no longer required by the War Office and Admiralty should not be pressed for sale or disposed of by public auction, but should so far as possible be disposed of for use in devastated countries and the remainder marketed gradually with the assistance of the manufacturers and their agents. All vehicles should be overhauled, before sold, by their manufacturers, and their subsequent condition guaranteed before sale. This, it is believed, would protect the reputation of the manufacturers and the interests of the buying public and would prevent the market from being flooded.

Want Government Export Aid

Lastly, there is a demand for a radical reform of the British consular service abroad and the establishment of a Ministry of Commerce. As regards the question of consular reform there may or may not be something in it, but I have a feeling, acquired by contact with the commercial representatives of most countries during the past fifteen years or so, that the consular service of any country never quite fulfills the hopes or desires of its business men. Whatever may have been the truth regarding German consuls abroad most of her motor manufacturers regarded them as of little use to their special industry. The British Board of Trade is very well served by its group of trade commissioners located in Australia, South Africa, New Zealand and Canada, and there are few openings of any value which they do not promptly report. These commissioners have a perfect network of able trade correspondents all over the dominions who are closely in touch with the needs of the localities in which they are situated.

The farm tractor problem continues to receive the close attention of the authorities, the farmers and the motor dealers. It was found necessary to place orders with United States makers for

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about 400 machines which it is hoped will be placed on this side at a very early date. This number would have been very much larger if there had been any hope of finding sufficient shipping accommodations. As it is there is some doubt as to the dispatch from New York of all the tractors now on order. Among those firms having large orders in hand are the makers of the Overtime and the Mogul—two outfits which are extremely popular here. I am told that the various builders are sending over twenty or thirty tractor experts to see to the running of new machines, and also, I take it, to report to their principals as to the conditions of farming prevailing in the United Kingdom and the type of implement most suitable for these conditions.

Only Kerosene Burners Wanted

It may be of interest that only those tractors which will work on kerosene are being considered, owing to the fact that all gasoline is being reserved for other purposes. Tractor owners are, of course, getting sufficient quantities of the lighter spirit for starting up their engines, but these quantities will be strictly limited by the Petrol Control Committee, which has charge of the distribution. Those firms who are interested in the export from your side of tractors designed to run only on gasoline will be quite disappointed that the conditions prevailing here will rule them out of consideration. But there was not a bit of use bringing such machines over if the farmers could not obtain gasoline. It was suggested that the authorities here could see to their adaptation so as to use kerosene, but the question of skilled labor for this work had to be taken into account, which meant that the suggestion could not be entertained.

If I may be permitted to do so, I would suggest that those tractor firms who wish to do a permanent business in this country should take some steps to ascertain the type of tractor that will be most satisfactory for British farming conditions. If a large number of machines are brought in here and they do not prove successful it will be that the trade will be very much prejudiced and the value of this form of traction seriously discounted for a very long time to come. Repairing and replacement facilities will have to be available at convenient centers if future business is assured. If those farm tractors which are now being put into service prove satisfactory and are reasonably durable a great impetus will be given to the new movement during the next 4 or 5 years and the few factories that we have here will not be able to meet the demand. As I have mentioned in previous correspondence, a number of commercial vehicle manufacturing concerns have under consideration the question of going into the tractor business. The present boom will no doubt have its attractions for many of them, especially if they fear that there may be a slump in trucks after the war.

My experience is not very extensive, but I gather from those interested in the subject that the type of motor tractor most likely to be useful on British farms is that in which the plow or other implement forms a part—a combined unit, something like the Moline-Universal outfit which was demonstrated here recently. The power unit would be carried between the leading and steering wheels or forward of them. The control arrangements will be fitted in such a way that the driver of the tractor may also be able to operate the plow or other implement that is being hauled. This is most important, as farmers are asking for something that one man can look after. Three or four furrows appear to be the capacity of the typical implement when used for this purpose, as all other work is generally less exacting. The price that is likely to attract buyers in large numbers will not be above $2,000.

Particulars of very interesting and strenuous tests of British-made commercial vehicles for the Russian government have just been made public, and the results are quite instructive. These tests were held in November last, and the course over which they were taken was one of the worst in England.

Sampling Russian Requirements

The Russian Purchasing Commission arranged the trials so as to give British makers some idea of the unusually severe conditions to be met with in Russia, where roads are conspicuous either by their poor character or their entire absence. The vehicles which took part in the tests were the A. E. C., made by the Associated Equipment Co.; the Leyland, Dennis, Thornycroft, British Berna, all 3-tonners; Austin armored cars, Crossley 3360-pound trucks and passenger cars and Clement-Talbot passenger cars.

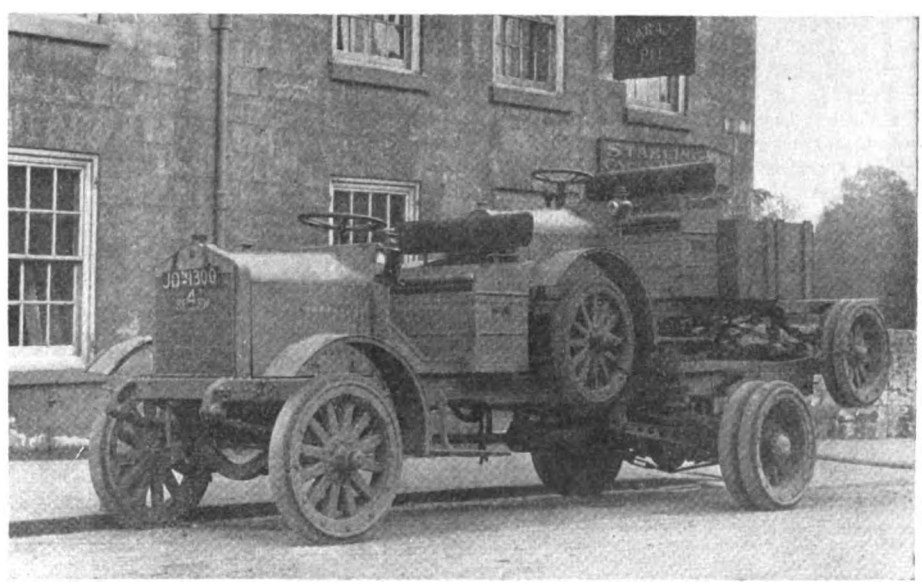
All had to carry a 30 per cent overload, but the heavy machines were unable to negotiate several stretches of very soft ground. In fact, on the first day they became hopelessly bogged, it is reported; efforts to dig them out were ineffectual on the first day's run. One vehicle, the Leyland, which had its differential absolutely buried in the soil, had to be dragged out by a team of sixteen artillery horses. The lighter machines were better able to get over the difficult places. On the second day a road was taken which included a swamp, but this was not tackled by the heavy machines. A pond was the next impediment, and this was successfully passed by all the lighter vehicles and the A. E. C. The Thornycroft got bogged and the Commission exempted the others from having to make the attempt. The third day was occupied with speed and other tests on fair roads.

What the Tests Proved

From what I can gather, these tests gave the British makers something in the nature of a shock, and they had to admit that if the bad stretches of road referred to were anything like those which were commonly met in Russia, the Russian Commission was fully justified in calling for special requirements. It may be stated that these special requirements are as follows:

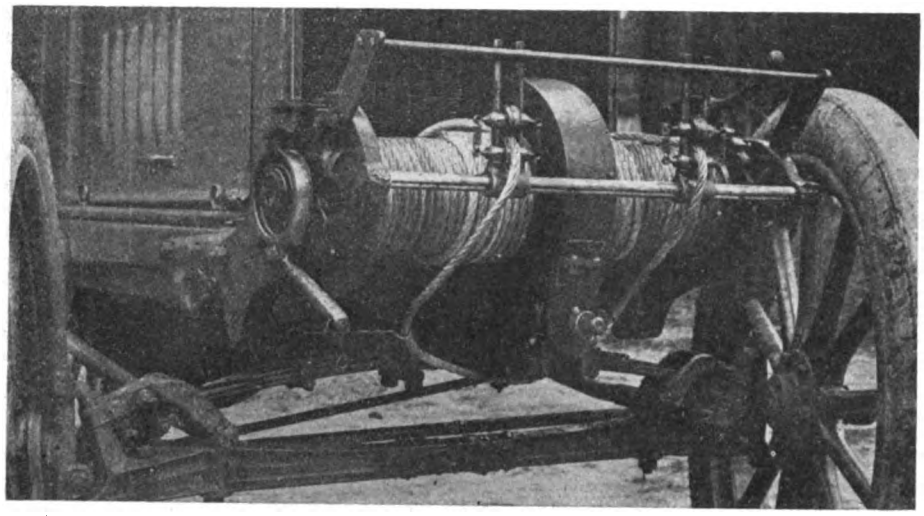
1—More powerful engines.
2—Stronger frames and springs.
3—Greater clearance.
4—Larger wheels and twin tires on all rear axles for passenger cars.
5—Especially strong bodies.
6—Accessibility of all parts for repair and simplicity, enabling repairs to be effected quickly without carrying a large amount of special material.

It has always been my opinion that a commercial vehicle for use in countries where the roads are unmade or are not of the best construction, should not be of a greater load capacity than 5000 pounds. They should drive on all four wheels, or if not some means of locking the differential should be provided while, of course, large wheels to give plenty of clearance are an undoubted necessity.—R. DOUGLAS-VICKERS.



A big Selden carrying its little brother on a 250-mile trip in England. The object was to save gasoline

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The double-drum winch driven off the extended engine camshaft

Ford Artillery Tractor Latest in War Trucks

By W. F. Bradley*

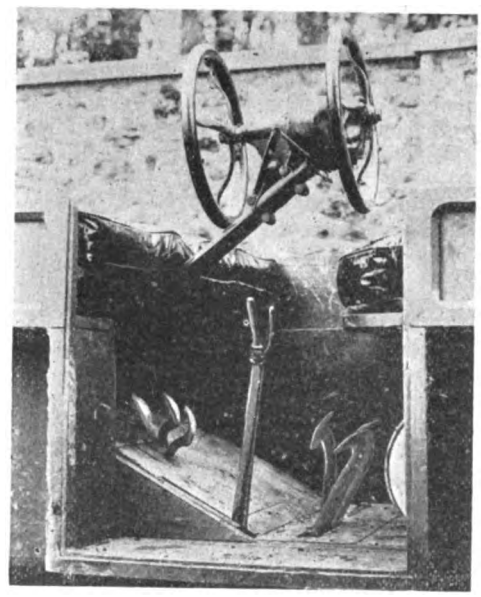
ONE of the requirements of artillery in the field is a powerful winch to be used for placing guns in difficult positions or getting them away from those positions onto the road. All the artillery tractors in service in France are fitted with a winch, which is made use of to pull the vehicle itself over difficult ground, or to move guns which cannot be hauled by direct towing. These tractors are made use of for the placing of guns in position, for which work their winches only are brought into operation. Experience has indicated, however, that this particular work could be done to better advantage by a lighter, more handy and more rapid vehicle than a tractor weighing from 5 to 10 tons.

Hauls Guns Off Roads

With these ideas in view an artillery officer having had considerable experience of gun haulage with all makes of European and American tractors has brought forth a Ford artillery tractor. The vehicle is too light, too high geared and underpowered for the haulage of artillery trains on the road. Its special construction, however, enables it to be taken over any kind of country and to reach any position it is ever likely to be required to take a gun into, and once in this position the Ford can, by means of its winch, haul the gun after it and place it exactly where required.

Two Steering Wheels

So far as the motor and transmission are concerned, there has been no radical change, the track has been widened, the wheels increased in diameter to give greater clearance, and also twin tires have been fitted at the rear. Double steering and control have been very cleverly carried out. The Ford steering column is retained, but at its head is mounted a short horizontal shaft carrying a bevel pinion meshing with a corresponding bevel on the steering column. At each end of the horizontal shaft there is a stock Ford steering wheel. The Ford pedals have been duplicated; thus the driver merely has to change from his ordinary seat to one just back of the dash to find all the usual Ford controls facing him.



The double steering wheels and controls

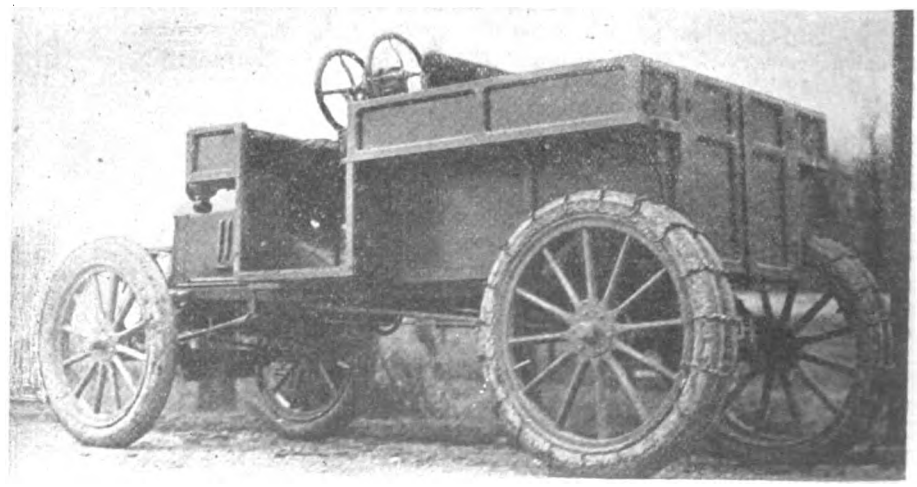
The Winch Details

The winding drum is really a separate unit bolted to the front end of the main frame members. It is driven from a forward extension of the crankshaft by means of worm gearing, giving a very low reduction. The winding drum is in two parts, one-half winding while the other half pays out the 60 yards of steel cable. Travelling guides are fitted for the cable to run through, there is a powerful ratchet and pawl and also a friction brake on the drum. As can be seen from the illustrations, the two brackets in which the main bearings of the winding drum are mounted are attached to the frame members by three bolts on each side. In addition, each of the two brackets has a hook forged with it to enable the entire vehicle to be anchored when hauling through its winch. The pull comes direct on the winding drum and is not transmitted through any member of the chassis.

Has Stood Up Under Test

This tractor has been tested under actual war conditions and found very satisfactory. It should be understood that it is not intended to compete with the big tractors for road haulage, but for all positions where a portable winch only is required it has proved itself of great value.

This unusual use of a Ford is but one of a great many which the present war abroad has furnished of the many possibilities of the motor vehicle. Like the great progress which motor trucks have made possible in the transportation of war material, it too should prove of value to the commercial user.



The Ford artillery tractor. Note unusual body and dual rear tires

*This is the first dispatch Mr. Bradley has been able to return to THE COMMERCIAL VEHICLE since Sept. 1, 1916. Shortly after that date he became connected with the ambulance service with the Italian army, having only recently returned to Paris. He returned from the Italian-Austrian front Jan. 12.

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Better and Cheaper Intercity Candy Delivery

Swift Motor Truck, Succeeding Railway Shipment, Regains Advantages Lost When Picturesque Horse Delivery Was Abandoned

SPEEDY delivery by motor truck has six important advantages over either horse or railway delivery, according to the experience of the largest manufacturer of confectionery in western New England. Kibbe Bros., a progressive candy firm 74 years old, bases its indorsement of motor delivery on experience, successively, with three different methods of delivery, namely, horse wagon, railways and trucks.

It finds that the motor truck is of primary advantage in that it gives prompter service, thereby earning the good will of the merchants who buy its products which in turn results in prompter payment of bills.

Less damage of goods is suffered because there are fewer handlings of the packages, and there is practically no pilfering. Although the breakage is less, less care need be given to packing. Instead of having to pack the goods in wooden cases for rail shipment, it is merely lightly wrapped.

An advertising advantage which was enjoyed to some extent under the ancient horse regime, but which was lost when distribution was made by express shipments, has been regained with even greater effect.

But perhaps the most telling of advantages are an actual decrease in the cost per 100 lbs. of delivery and a 20 per cent increase in business at points so served.

Large Pneumatics Used

The vehicle which has worked these wonders is a standard White 1½-ton chassis fitted with springs for a 2-ton load and mounted on pneumatic tires, 40 by 8 in the rear and 37 by 5 in front. The Kibbe Bros. plant is located at Springfield, Mass., from where the White truck delivers sweetmeats throughout western Connecticut. The truck supplies points as distant as New Haven and even Bridgeport, making such trips all in one day.

Robert J. Cleeland, vice president, states the full case for the truck as follows:

The Story of the Kibbes

"As boys at school, the Kibbe brothers made simple sweetmeats and sold them to their comrades. In 1843 the foundation was laid for the present Kibbe's—The House of a Thousand Candies. The fame of the products of the original one-room factory spread. Not only Springfield but the surrounding towns were calling for Kibbe's candies.

"The problem of delivery was a serious one. There were practically no transportation facilities. Both of the Kibbe brothers were ardent horsemen, and with horse-drawn vehicles they solved the problem of delivering their product. Many a youngster—now perhaps the head of his own family of youngsters—has beheld with rapture the arrival in town of Kibbe's Chariot of Sweets.

"Aside from the knowledge of its precious burden, there were pictures on the sides of the chariot that appealed to young America. A red Indian mounted on a wild pony galloped in pursuit of a buffalo. On the other side a typical Buffalo Bill, rifle in hand, was scouting for Indians.

"Eventually there were eight of these vehicles. Each was drawn by four beautiful white horses; white because Horace Kibbe said: 'A white horse shows its care or the lack of it.'

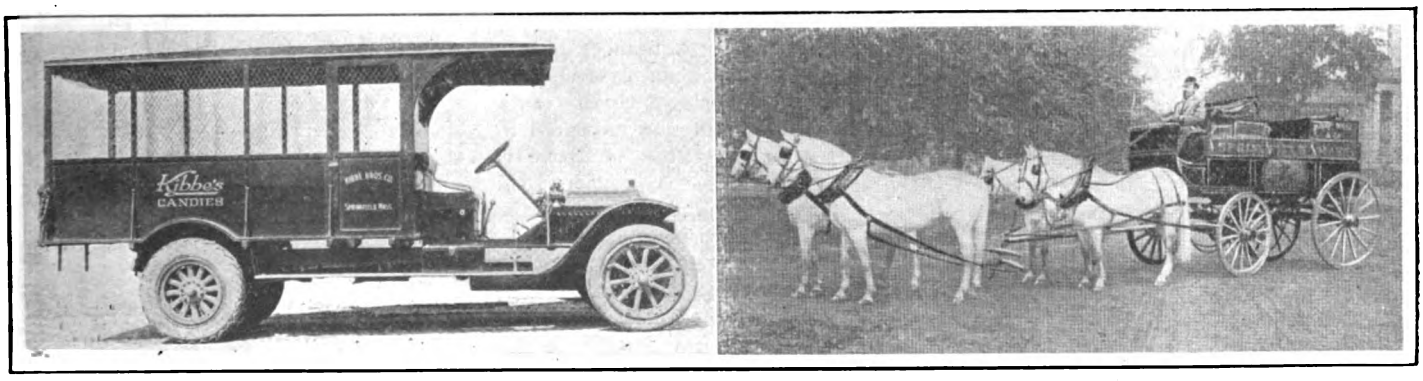
"There were nearly 2 tons of candy locked in the compartments of each wagon as it set out on its journey. They were away about 4 weeks and returned with no candy but numerous boxes of pennies which they had collected from candy dealers along their routes.

"In the winter season a combination of wheels and runners enabled the driver to meet existing conditions of the roads. As transportation facilities improved, Kibbe's four-in-hands yielded, one by one, to superior methods of delivery, and in 1890 the last of the eight was withdrawn. Orders were taken by salesmen who drove single hitches and the candy was delivered by railroads.

Railroad Fails to Satisfy

"History repeats itself and in 1915 Kibbe's again found transportation facilities inadequate. Freights were slow and express expensive. The motor vehicle was called upon to solve the problem. Candy must be delivered promptly. 'Fresh from the factory' is the retail merchant's slogan.

"One of our White 2-ton trucks furnishes perhaps the best example of Kibbe's quick delivery, direct from the factory to the merchant's door. This truck covers that section of Connecticut west of the Connecticut River. Very often it carries its capacity load to points 75 miles from Springfield. There are usually from forty to fifty stops, and two of the long trips are made every week. During the other days nearby points are covered."



One White four-cylinder truck replaces many white four-horse teams in distributing Springfield sweetmeats

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Devoted to topics pertinent to commercial vehicle operation design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

MOTOR TRUCK HAULAGE RATES

What Haulage Contractors Charge in New York and Chicago

To the Editor, COMMERCIAL VEHICLE:

I desire to obtain the rates commonly charged for motor truck haulage in New York and Chicago.—D. O. S., New York City.

In New York City the daily basis of charge is used for motor truck haulage by trucking contractors. The usual rate for a 5-ton truck is $25 a day of 10 hr., with a maximum mileage of 60. If either the time or mileage is exceeded an extra charge is made accordingly. The concern for whom the work is done is also required to pay all ferriage charges.

In Chicago the manner of charging is quite different. The standard for a truck of any capacity is $1.50 per hr. with a driver only, for all classes of service. The helper is usually furnished by the concern for whom the job is done, as Chicago drivers are mostly well unionized and it is difficult to get them to assist in the loading and unloading. Of course, for lighter vehicles than perhaps 3 tons, the charge would be somewhat less.

A special rate, regulated by city ordinance, is applied to the handling of furniture in Chicago, this being $2 an hour with two men for the time required for loading and unloading and 65 cents a mile for the distance travelled.

The Chicago rates work out considerably cheaper than the New York rates, namely $15 and up for a truck and driver with no restrictions on mileage.

SOME PRODUCTION STATISTICS

98,000 Trucks Built in 1916, of which Less Than 20,000 were Exported

To the Editor, COMMERCIAL VEHICLE:

We are very much interested in obtaining certain information as to the number of trucks produced in the United States during the year 1916 and we are taking the liberty of asking you for this information if you have same:

1—How many commercial cars were in service in the United States as of January 1, 1917?

2—How many commercial cars were manufactured during 1916, exclusive of converted passenger cars?

3—How many commercial cars of the 1916 production were exported?

4—How many passenger cars were converted into commercial cars by means of the removal of the touring car body and replacing same with a commercial one?

5—What was the approximate 1916 production of truck attachments, such as Smith, Maxfer, etc.?—A. J. B., Detroit.

1—According to estimates made and published in THE COMMERCIAL VEHICLE of January 1, 1917, 198,000 commercial vehicles were at that time in use in this country.

2—The same estimates placed the number of commercial vehicles manufactured last year at 98,000.

3—Exports were estimated at 20,000. but an unforeseen falling off occurred, so that the actual exports for the calendar year were but 18,903, or 1,097 short of the estimate.

4—There are no available, reliable statistics on this subject.

5—See No. 4.

ARTICLE ON BONUS SYSTEMS

How Truck Users Reward Extra Service on Their Drivers' Parts

To the Editor, COMMERCIAL VEHICLE:

Can you tell me where I can secure data on bonus systems now in practice on the loading and unloading of trucks or on truck transportation in general? Can you tell me of any articles covering bonus systems, as above? — GRIDLEY ADAMS, MacAvoy Advertising Co., Chicago.

An article covering a number of approved and tested bonus systems for drivers of motor trucks, including data on systems actually in use, appeared in THE COMMERCIAL VEHICLE of Oct. 15, 1916, under the title "A Square Deal Basis of Successful Bonus Systems for Drivers." There have been previous examples of bonus systems in this magazine, but the one above covers all salient features and is the most complete treatise on the subject known to its editors.

TWO-WHEELED TRAILER BUILDERS

York State Central Station Interested in Those of Light Capacity

To the Editor, COMMERCIAL VEHICLE:

We would like to know the addresses of manufacturers of whom we could get information and details of trailers of the two-wheeled type in capacity from 500 to 1000 lb.—V. B. VOTH, manager, Ogdensburg Power & Light Co., Ogdensburg, N. Y.

Two-wheeled trailers are of two sorts, the full trailer type and the semi-trailer type. The former is an independent load-carrying unit somewhat like a cart, depending upon the drawing vehicle only for propulsion and longitudinal balancing. The latter is a two-wheeled trailer, which is built along the lines of a four-wheeled unit, but whose front end is intended to rest upon the rear of the tractor, thereby sharing its load. Manufacturers of semi-trailers, however, with one exception, do not make them in the light capacities specified, but usually in large tonnages. Makers of two-wheeled cart type trailers are:

American Carriage Co., Kalamazoo, Mich.
Auto-Kamp Equipment Co., Saginaw, Mich.
Auto Specialty Mfg. Co., Cedar Rapids, Ia.

Bettendorf Trailer Co., Bettendorf, Ia.
Buob & Scheu, Cincinnati, O.

Cleveland Paxson Co., Cleveland, O.
Columbia Wagon Co., Columbia, Pa.
Commercial Sales Co., Minneapolis, Minn.
Cozy Camp & Auto Trailer Co., Indianapolis, Ind.
Curtis Trailer Co., Minneapolis, Minn.

Defiance Carriage Co., Defiance, O.
George Delker Co., Henderson, Ky.
Detroit Trailer Co., Detroit, Mich.
Dunkley Co., Kalamazoo, Mich.

Emerson-Brantingham Implement Co., Rockford, Ill.
Erie Trailer Co., Erie, Pa.

Harper Buggy Co., Columbia City, Ind.
William G. Hesse & Son, Leavenworth, Kan.
Hopp Carriage Co., Mifflinburg, Pa.

John P. Laura, Coldwater, Mich.
Lion Buggy Co., Cincinnati, O.
Lowell Cutter Co., Lowell, Mich.

Mayer Co., Chicago.
Meeker Mfg. Co., Dayton, O.
Michigan Auto Trailer Co., Detroit.
Mifflinburg Buggy Co., Mifflinburg, Pa.
Miles Mfg. Co., Jackson, Mich.

Ohio Trailer Co., Cleveland, O.

Page Bros. Buggy Co., Marshall, Mich.
Parry Mfg. Co., Indianapolis, Ind.
Puffer-Hubbard Mfg. Co., Minneapolis, Minn.

H. C. Randolph, Jonesville, Mich.
Rogers Bros. Co., Albion, Pa.

August Schubert Wagon Co., Oneida, N. Y.
Shattuck Trailer Co., Minneapolis, Minn.
Stunkard Bros. Buggy Co., Brazil, Ind.
Universal Trailer Co., Chicago.

Warner Mfg. Co., Beloit, Wis.

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Manufacturers of the semi-trailer type in the light capacities you mention are:

Martin Rocking Fifth Wheel Co., Springfield, Mass.

ARTICLE ON FORD ADAPTERS

To the Editor, COMMERCIAL VEHICLE:

The writer remembers having read, during the last 2 or 3 months, a very interesting article dealing with Ford truck attachments and similar devices. Can you perhaps tell if this article appeared in your magazine, or do you remember just where it was printed?—O. P. BRETSCHNEIDER, Marburg Bros., New York City.

This article appeared in two parts, Part I being published in the Aug. 15, 1916, issue of THE COMMERCIAL VEHICLE, page 18, and Part II in that of Sept. 1, page 26.

NO RECORD OF KRILL TRUCK

To the Editor, COMMERCIAL VEHICLE:

Will you please advise me if there is any such commercial vehicle known as the Krill and if so where it is made, by whom and in what various tonnage capacities.—C. HAIGHT, E. Chicago, Ind.

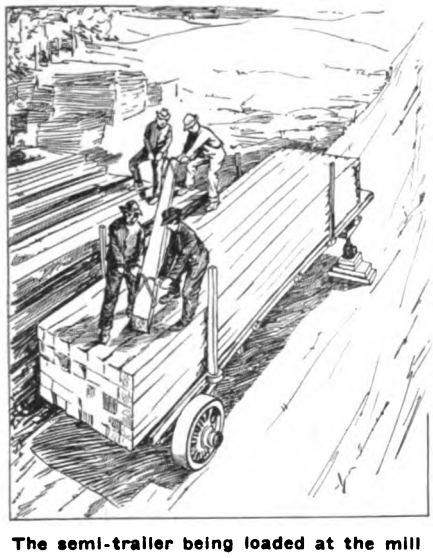
We have no record of any such motor truck as the Krill and to the best of our knowledge no such truck was ever offered on the American market.

TRACTOR AND TRAILER FOR LUMBER

How Large Loads of Timber May Be Economically Transported

To the Editor, COMMERCIAL VEHICLE:

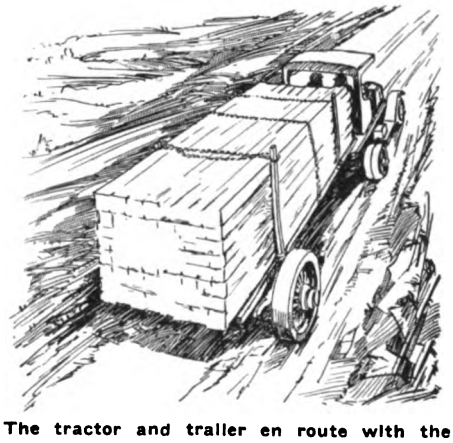
We desire to haul rough lumber about 20 miles over a rough country pike and want to carry about 10,000 feet per load, which means 40,000 or 50,000 lbs. If you can give us the names of concerns who have specialized in handling this kind of loads, give us the kind of truck concerns, and if possible give us the names of some tractor concerns and would appreciate your suggestions about how would be the best way to handle this, whether it would be best to handle this heavy load on one truck or tractor or whether it would be best to have a bunch of trailers, and any other information you can give us will certainly be appreciated.—H. T. WHITSON, H. T. Whitson Lumber Co., Algood, Tenn.



The semi-trailer being loaded at the mill

It is impossible to give any definite recommendations without additional and more definite data. To determine even roughly what method would be best to pursue one should know what amount of lumber would have to be moved daily or weekly, how much time can be allowed in transit and to what extent the volume of tonnage to be transported will vary at different times. The lengths of the timbers should also be stated.

However, in lieu of more definite data, we may base a tentative opinion on assumptions, subject to change. If the figure 10,000 represents the average daily board feet of lumber to be transported and 40,000 and 50,000 lbs. the maximum and minimum average weights, the problem becomes one of hauling from 20 to 25 tons of lumber daily a distance of 20 miles. It may also be assumed that the timbers come in 20-foot lengths.

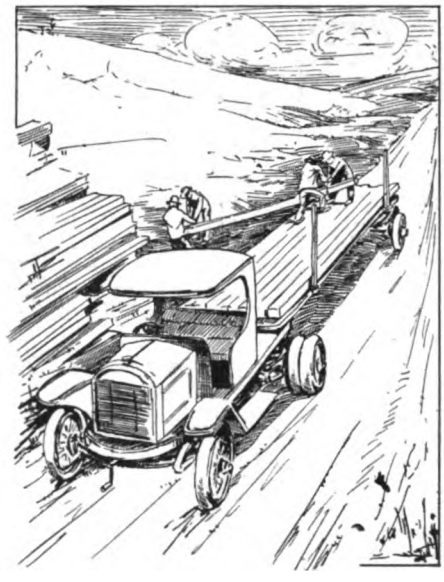


The tractor and trailer en route with the full load

To attempt to carry this amount of lumber on single vehicles is out of the question. The largest trucks now built have a load capacity of 7½ tons. Whether it would be practicable to haul such a load on a tractor-semi-trailer train depends upon the nature of the "rough country pike" to be traversed.

Without grades of too great severity, sand of too great depth, mud bogs too soft, bridges and culverts too weak or improved roads too fragile to sustain a total weight of perhaps 30 tons or more and as much as 18 to 20 tons on the trailer axle, this might be done with wide enough tires.

Another limiting factor, however, is the size of such a load. Oak timber weighs about 46 to 48 lbs. per cu. ft. The maximum practicable load of timber would be about 8 feet wide, possibly the same height, if the roads are reasonably level, so that if the timbers are 20 feet long, this would be 20 by 8 by 8 feet or 1280 cu. ft. Such a load at an average of 47 lbs. per cu. ft. for oak timber would weigh 61,160 lbs.



Trailer load almost off at unloading point

This load would be easy to handle on a vehicle of this description, the most convenient form, if varying lengths are to be hauled being a lumber dolly, so called, comprising a two-wheeled cradle with a swivelled bolster and stakes to hold the load and a pole to be attached to the rear of the tractor. Obviously for such a long and heavy load an ordinary truck would not do, although any one of a number of special tractors would serve. An advantage of the trailer method would be that it could be detached from the tractor for loading and unloading, the tractor immediately hitching onto another trailer for another trip.

With three such trailers, the tractor could leave the mill in the morning with a loaded trailer. Arriving at the unloading point it could unhitch and couple onto an empty trailer and return to the mill immediately, possibly carrying a return load of supplies on the trailer. Reaching the mill again, it could uncouple its empty trailer and be ready to couple onto a loaded trailer again in the morning. This endless cycle of operations is illustrated herewith.

Manufacturers of tractors suitable for this work are as follows:

Bulkley-Rider Tractor Co., Los Angeles, Cal.
Couple-Gear Freight Wheel Co., Grand Rapids, Mich.
Dominion Tractor Co., Detroit, Mich.
Federal Motor Truck Co., Detroit, Mich.
Garford Motor Truck Co., Lima, Ohio.
International Motor Co., New York City.
Kelly-Springfield Motor Truck Co., Springfield, Ohio.
Knox Motors Associates, Springfield, Mass.
Locomobile Co. of America, Bridgeport, Conn.
Peerless Motor Car Co., Cleveland, Ohio.
Walter Motor Truck Co., New York City.

Trailers of the lumber dolly type are made by the following, in addition to which any good wagon or body builder can construct them to order:

Detroit Trailer Co., Detroit, Mich.
Shadbolt Mfg. Co., Brooklyn, N. Y.
Variety Mfg. Co., Chicago.
Watson Wagon Co., Canastota, N. Y.

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Army Trucks In Mexico

(*Continued from page* 17.)

adequate supplies of food before he had exhausted the supplies taken with him from Columbus.

"In a little more than 4 days after orders were placed with the manufacturers, these trucks had gone across the border at Columbus, 1600 miles away from the factory, loaded with supplies."

Anent trailers, the report states that during the fiscal year eleven 2½- to 3-ton trailers and one 1½-ton trailer were purchased for use on the border, but that they did not prove satisfactory owing to the exceedingly bad road conditions, a thing, by the way, which any experienced commercial operator of trucks could have told the officials before the expenditure of $8,023.50 in equipment and a great deal of time, money and grief in making the experiment themselves. It is granted, however, that they will be useful "on the line of communications," this being intended to embrace instances where there is some semblance of roads, no doubt.

Other Equipment Purchased

Horses and mules to the number of 17,405, costing $2,713,254.68, were purchased during the same fiscal year, as against 661 motor trucks, seventy-five motor cars for officers, etc., sixty-one motorcycles and eight tractors, costing $2,175,670.09.

Besides the commercial units purchased, the department secured three Holt caterpillar tractors, two Phoenix Centipede tractors, two Knox towing winch tractors, one Buckeye tractor, three Monarch road rollers and eighteen Watson bottom-dump trailers with other road-building equipment in a belated attempt to save the appalling waste of expensive transportation machinery due to bad roads.



An example of some of the poor roads encountered by the Diamond-T 2-tonner on its 1,547 mile trip from Chicago to Tampa

1,547 Miles Overland by Truck from Chicago to Tampa

THROUGH 1547 miles of mud a Diamond-T truck recently ploughed its way from Chicago to Tampa, Fla. The route was over the Dixie Highway which the drivers say resembled a river more closely than it did a road. The total weight of the truck fully loaded was 9200 lbs. However, in places the going was good, and better time was made.

The worst difficulty which the drivers encountered was getting stuck hub deep in the mud. The remedy for this was to tie a rope to a tree about 20 feet ahead, attach the rope to the wheels which were revolving in the mud, and see to it that the rope did not get tangled. In this way the wheels wound the rope, continually tightening it, and drawing the vehicle towards the tree.

Another obstacle to safe travel was the number of weak bridges found along the way. At a bridge 10 miles south of Ocilla, Ga., one of the rear wheels went through the planking. After that the drivers inspected bridges in advance, and carried two long beams which could be stretched across a bridge in case of weakness.

According to reports from the drivers, the total damage experienced on the trip was one lost fan belt and four broken spring slip bolts.

Proves Possibility of Overland Hauls

The trip was undertaken to show the durability of the Diamond-T truck, and also to indicate the practicability of using trucks for long as well as short hauls. The truck was loaded with parts for the company's distributer in Florida, and the journey served therefore as a useful means of transportation in addition to being a good means of advertising the truck.

The truck carried a display sign which stated that it was on the journey from Chicago to Florida, and this attracted many inquirers at points where the vehicle stopped along the journey.

Of all the difficult points along the journey some of the Georgia roads proved to be the most trying. The soft Georgia clay is extremely sticky, and the car would usually have to proceed by a series of running starts.

Wanted Ideas on Good Truck Repairs

See pages 10 and 11



A weak bridge which gave way in Georgia. Thereafter all bridges were tested for their strength before crossing

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Seagrave Brings Out First Truck With Eight-cylinder Engine

SEAGRAVE SPECIFICATIONS

Capacity, lbs	7,000
Price	$0,000
Wheelbase, in.	156
Tires, front	36x5
rear	36x5d
Bore, in.	3¼
Stroke, in.	5
N. A. C. C. hp	33.84
Speed, r.p.m.	
m.p.h.	
Gear ratio in high gear	12-1
Final drive	Worm

EIGHT cylinders are used in a motor truck for the first time in the Seagrave, built by W. E. Seagrave & Co., Walkerville, Ont., a concern which for a number of years has been prominent in the fire apparatus field. The Seagrave truck is made in 3½-ton capacity, at present, though 2- and 5-ton sizes will also be built. Besides its eight-cylinder engine, the truck is standard in construction except that Sewell cushion wheels are optional equipment with the solid wood type.

The engine is a Herschell-Spillman V-type eight, incorporated with the clutch and gearset to form a unit powerplant, supported directly from the mainframe on three points. The cylinders are cast in two blocks of four each, these being of the L-head type, the valves within the V and operated from a single camshaft. Centrifugal pump cooling water circulation is provided, through a cast-tank finned-tube radiator. This radiator is unusually wide because of the width of hood demanded by the eight-cylinder engine. The fan is gear driven.

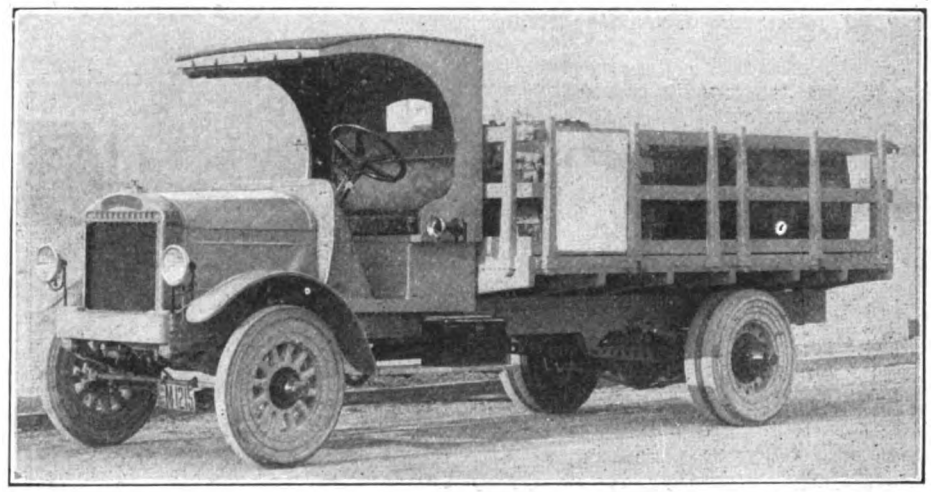
The carbureter is located between the cylinder blocks, fed by gravity from a tank beneath the seat. A centrifugal governor is applied and is mounted separately above the carbureter.

Battery ignition is used, supplied from the Westinghouse electric starting and lighting system which is standard equipment. This is of the two-unit type.

A dry-disk clutch and three-speed selective gearset take the drive from the motor, from whence it is conducted by a two-part shaft to the rear axle. This shaft has three universals and a central bearing to reduce the free length of shafting and thereby prevent whipping.

The axle is a Timken worm-driven one of the floating type, torque being taken by the springs and propulsion by radius rods. Brakes are of the usual Duplex type, so arranged with their linkages that the controls may be reversed so that if the foot brake becomes worn, the other brake may be connected with the foot control and the hand control connected with the worn foot brake.

The frame is of rolled channel steel with a substantial bumper at the front. Left steer and central levers are used, the wheel being 22 inches in diameter and acting on the axle, fore and aft.



The Seagrave eight-cylinder truck, a 3½-tonner with final worm drive

Three Models Now Comprise Denby Line—All Have New Engines

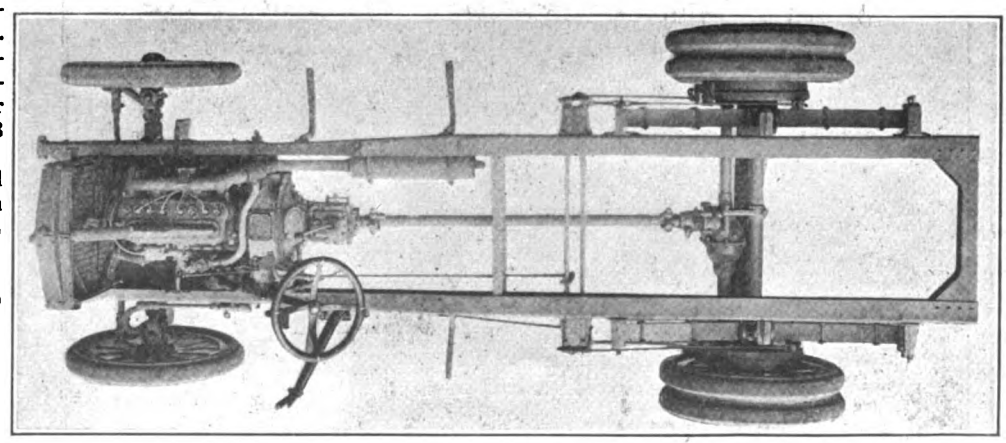
REDUCTION in number of models and increase in capacity ratings have been made by the Denby Motor Truck Co., Detroit, recently. The former four models have been condensed to three by the combination of the 1½- and 2-tonners into one chassis rated at 2 tons. The 1-tonner remains at the same rating, but has been strengthened in various parts while the erstwhile 2½-tonner has received an increased rating to 3 tons.

No changes in appearance or general construction have been made, but such important units as the engines have been entirely changed. The new series Denbys now use Continental engines, all three models using the same design, except that the two larger ones have ¼ inch greater bore.

The new engine is the Continental Model N, which is block cast with valves at the right. It is incorporated with the clutch and gearset to form a unit powerplant. This engine has a separate head casting and a pressed steel bottom crankcase half. Cooling is effected by thermo-syphon water circulation through the characteristic finned-tube cast case radiator. Bolted to the left side of the

DENBY SPECIFICATIONS

Capacity, lbs.	2,000	4,000	6,000
Price	$1,275	$1,775	$2,150
Wheelbase, in	...	144	144
Tires, front	...	...	36x4
rear	...	...	36x7
Bore, in.	3½	3¾	3¾
Stroke, in.	5	5	5
N. A. C. C. hp	19.61	22.50	22.50
Speed, r.p.m.	1,300	1,275	1,275
m.p.h.	16	14	12½
Gear ratio in high gear	8¼-1	9¾-1	10.9-1
Final drive	Internal gear		



The new Denby 3-tonner which has a Continental motor and employs a Russel internal-gear-driven axle

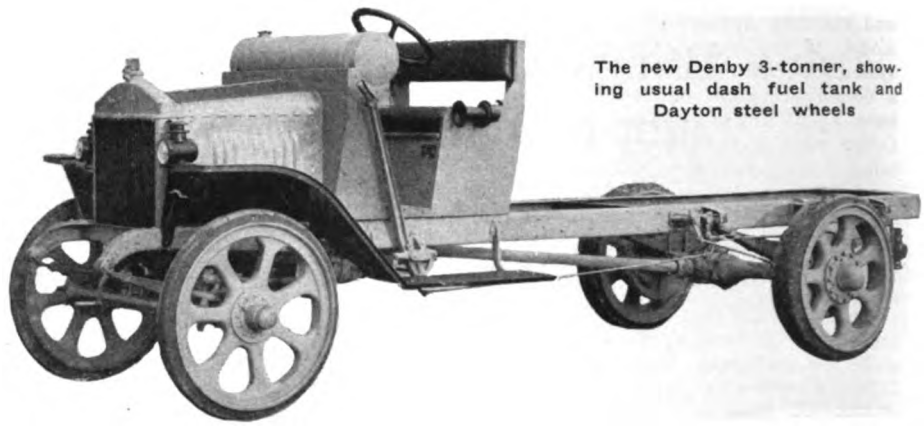
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engine is the carbureter, the manifold being cored out of the cylinder block. A Monarch suction governor is applied above the carbureter and the fuel is fed by gravity from a cylindrical tank on the dash, in each model. The dash tank follows previous Denby practice.

A Dixie magneto of the single type is employed for ignition, the spark advance being fixed. A two-unit electric starting and lighting system, with ignition as well, if desired, will be fitted at extra charge. Either the Gray & Davis or the Bijur system will be applied, and a Willard or Prestolite battery.

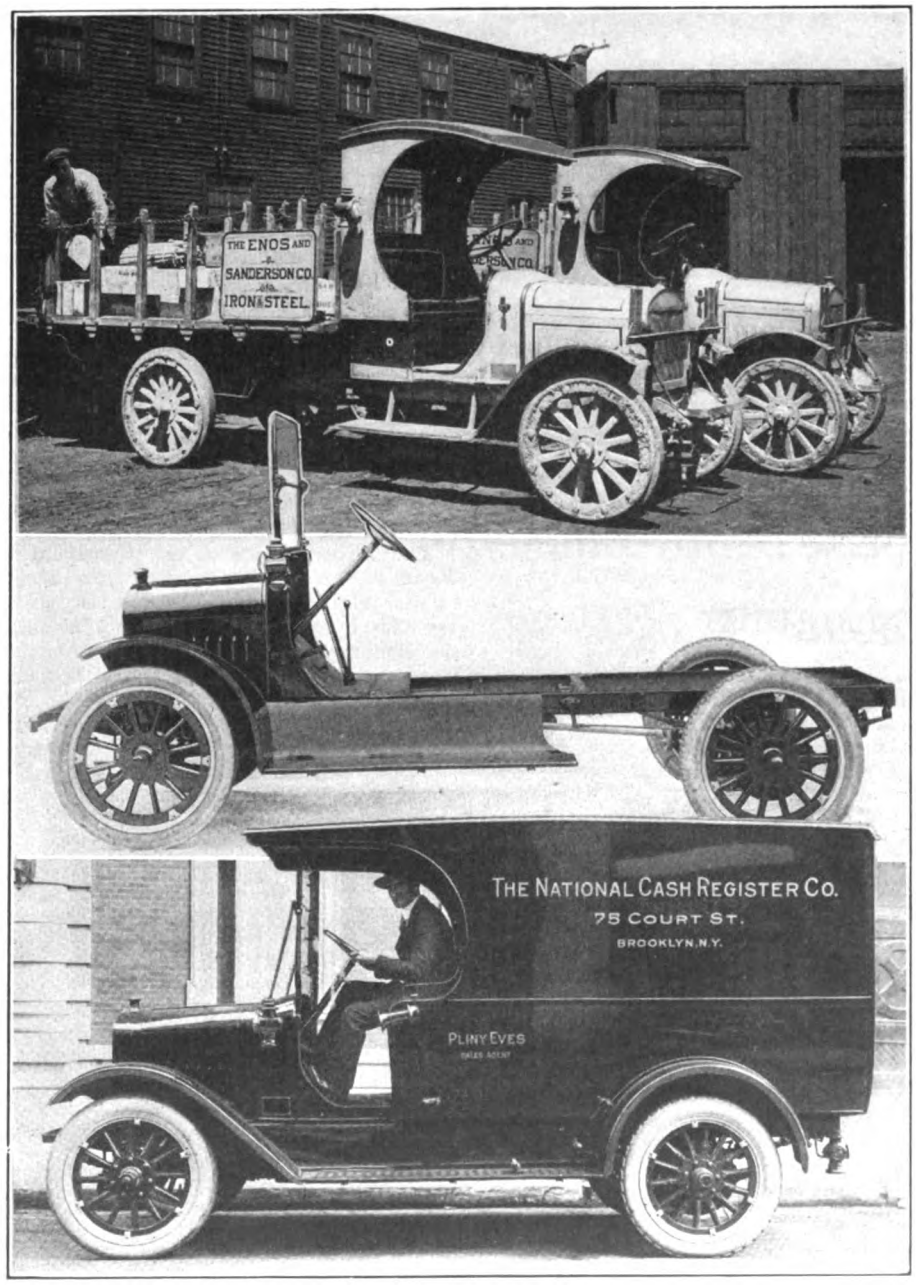
In the clutch, too, has been improvement, the number of disks having been increased from seven to fifteen, faced with Raybestos and running dry, as before.

As always, the trucks are all internal-gear driven, Russel axles being used. They all follow the Hotchkiss driving plan.



The new Denby 3-tonner, showing usual dash fuel tank and Dayton steel wheels

Stewart Capacities Increased and Electric Units Added



Stewart 1½-tonner at top; ¾-ton model in center and 1-tonner below

ALTERATIONS, chief among which is an increase in the capacity of all models, have been made by the Stewart Motor Corp. in its three commercial chassis. While these changes do not change the outward appearance of these models, some of them are important. Formerly the three models were respectively of ½-, ¾- and 1¼-ton capacity; but at present they are of ¾-, 1- and 1½-ton ratings. Prices have been increased and electric starting and lighting applied.

STEWART SPECIFICATIONS

Capacity, lbs.	1,500	2,000	3,000
Price	$795	$1,390	$1,485
Wheelbase, in.	110	*118	140
Tires, front	32x4	34x3½	34x3½
rear	32x4	32x4	34x5
Bore, in.	3	3½	3½
Stroke, in.	4¼	5⅛	5½
N. A. C. C. hp.	14.40	19.61	19.61
Speed, r.p.m.	1,600	1,850	1,750
m.p.h.	25	25	25
Gear ratio in high gear.	6-1	7-1	7-1
Final drive	Internal gear		

*128 optional.

In detail the changes in the smallest model embrace principally general strengthening for the additional capacity which the manufacturer has determined upon. The wheelbase has been increased from 106 inches to 110 and a more robust clutch and gearset have been installed, the latter supplied by the Detroit Gear Co., the clutch being of the dry-disk type.

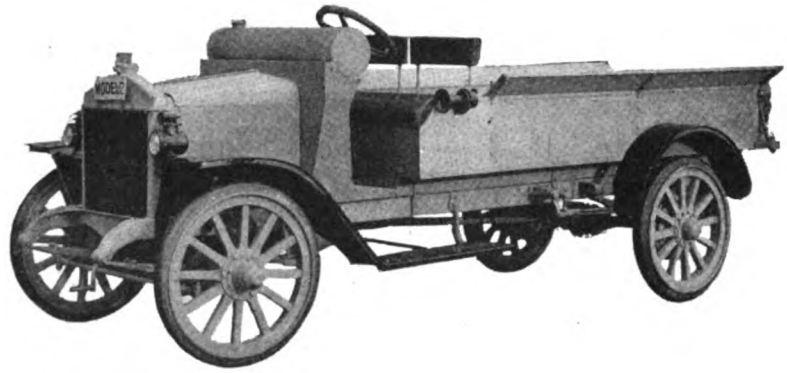
Besides this, the Bosch system of starting and lighting has been provided for at an extra charge of $125. This system is of the one-unit type, operating at 12 volts. The battery is of 60 ampere-hour capacity. The price has been raised from $695 to $795.

The medium-sized type, increased from 1500 pounds to 1-ton rating, sells for $1,390 instead of $1,290. The standard wheelbase is the same, but an additional length of 128 inches is offered on option. Pneumatic tires have been replaced by solids and the former dry-plate Fuller clutch has been succeeded by a dry-disk type of the same make. A Westinghouse single unit lighting

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and starting system is installed in this model, if desired, at $100 extra, this system operating at 6 volts and having a 60-ampere-hour battery. Gear-ratios have been altered, although the same Celfor rear axle is used, the reduction being 7 to 1 instead of 6 to 1 on high gear, with corresponding changes in the other speeds, of course. The make of springs has been changed, the Detroit self-lubricating style being now employed.

The new 1½-tonner differs from its predecessor in several ways. It is priced at $1,485 whereas the 1¼-tonner was $1,390, its wheelbase is 140 inches instead of 128, its tires are wider and smaller in diameter, like the others it has a starting and lighting system, this time a Westinghouse outfit, priced at $100 extra, and it has a new dry-disk clutch replacing the older dry-plate form.



The Denby 1-tonner, one of a line of three new models, all internal-gear driven

Maxfer 1-tonner Is Electrically Started and Lighted

MAXFER SPECIFICATIONS

Capacity, lb.	2,000
Price	$1,195
Wheelbase, in.	130
Tires, front, pneumatic	34 x 4
Tires, rear, solid	34 x 4
Bore, in.	3½
Stroke, in.	5
N. A. C. C., hp.	19.61
Gear ratio in high gear	
Final drive	worm

PRODUCED by the Maxfer Truck and Tractor Co., Chicago, which previously made the Maxfer Ford adapter only, the new Maxfer truck is a 1-ton worm-driven truck assembled from standard parts and featuring a complete electrical equipment. The Maxfer Ford adapter will be continued as before, the new truck singalizing the entrance of the company into the conventional truck field.

The truck follows accepted truck engineering practice and has its engine located under a hood forward of the dash. The engine is block cast with cylinders 3½ by 5 and is in a unit with a cone clutch and a three-speed selective gearset.

Thermo-syphon water cooling is employed with a vertical tube type radiator and a sheet metal casing.

Ignition is by means of a Delco system of 6 volts and 100 amperes in connection with a Willard battery, thus forming a two-unit outfit for starting and lighting in which bendix drive is used on the starter.

From the gearset the drive is taken through a driveshaft with two universals to a worm-driven axle of David-Brown type and fitted with the Bailey non-stall differential. The rear axle is of the semi-floating type and is fitted with Bock bearings throughout.

The springs, which are unusually long and flat, 51 in., are arranged on the Hotchkiss plan to take both the driving torque and propulsion.

Both sets of brakes are on the rear wheels, the hand brake being of the internal type and the foot brake, external. The hand brakes are 13½ in. in diameter and 2½ in. wide; the foot brakes, 14 in. in diameter and also 2½ in. wide. The frame is of pressed steel of the semi-flexible type. It is 4½ in. deep and made of 3/16 in. stock.

Wheels are of wood, 34 by 4 all around and fitted with 34 by 4 pneumatics in front and 34 by 4 solids in the rear.

The steering wheel, of the usual screw-and-nut irreversible type, is located at the left, with the control levers in the center.

Curtains and windshield form parts of the regular cab equipment which permits of a body 4 ft. 6 in. wide and from 9 to 11 ft. long according to the permissible overhang aft the rear of the frame as determined by the class of goods to be carried.

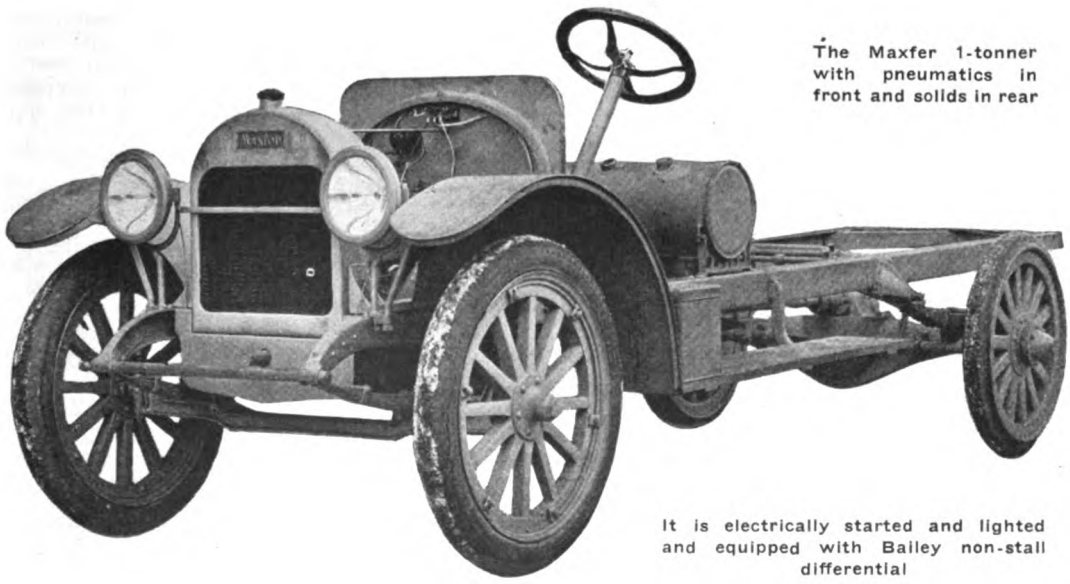
The truck was further illustrated and described in the last issue of THE COMMERCIAL VEHICLE in connection with the articles on the Boston and Brooklyn shows where the vehicle was exhibited for the first time in the East.

The employment of pneumatic tires in front and solids in the rear as standard equipment enables the truck to make slightly greater speed than if fitted with solids.

The electric starting equipment should prove of considerable value to the driver because of eliminating the hand cranking, especially if the vehicle should be used in work where there are many stops.

Better Truck Repairs

See pages 10 and 11



The Maxfer 1-tonner with pneumatics in front and solids in rear

It is electrically started and lighted and equipped with Bailey non-stall differential

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Accessories for the Truck

Autocar Service Kit Eliminates Truck Idleness Due to Delays in Getting Spare Parts

INTRODUCED to facilitate the speedy repair of Autocars so that their owners will not have to keep their vehicles out of service for undue periods, the Autocar service kit, first announced in the February 1, 1917, issue of THE COMMERCIAL VEHICLE, consists of a small box containing an assortment of parts most often required by Autocar owners. The kit came into existence through a demand from two sources. More and more Autocars and motor trucks generally are being sold in country districts somewhat removed from the nearest service station and where repair parts are not so readily obtainable as they are in the larger cities. Again, many of the large Autocar fleet owners are establishing their own repair departments and are keeping a stock of repair parts on hand in their own establishments. In such cases, the service kit offers a ready means of keeping a stock of parts always on hand, and by a proper selection of the parts included, enables the Autocar owner to greatly lessen the possibility of having to lay up his truck awaiting the receipt of some small part.

The kit box is approximately 36 in. long, 25 in. wide and 20 in. deep, and is provided with three tray-like drawers, as shown in Fig. 1. The same sized box is supplied in every case, although the individual owner may select a large or a small number of parts as he chooses, according to the number of trucks he has in use, what parts have been found to need replacing most often in his own particular case, or how far away he is from the nearest service station.

The Autocar company also publishes a list of the parts furnished with the average kit, and which it considers will be the most useful to users generally. This list also contains the prices of the various parts, the quantities in which they are supplied in the kit and their order numbers. The parts supplied with the average kit include motor parts, such as valves, connecting rods, piston rings and the like, and gearset and rear axle parts in addition to nuts, bolts, gaskets, etc.

A special feature of the manner of furnishing the kit which should prove attractive to both small and large users of Autocars is the fact that any or all of the parts originally selected may be returned to the company at any time for other parts of equal cost, for credit or for cash. This, in reality, makes the cost of the kit only the actual cost of what parts are used and the interest on carrying the investment. The cost of the parts furnished in the full list is $204, with no charge made for the chest.



Fig. 1—The Autocar service kit, showing construction of standard box and some of the parts furnished. These may be changed to suit the purchaser

If an owner purchased the full list of parts, the annual cost of the service rendered at 6 per cent on the $204 would be only a little over $12 per year in addition to the cost of the parts actually used. This small sum should prove to be a most attractive form of insurance to large or small users against their trucks being laid up for excessively long periods merely for the need of some small part whose cost is negligible as compared with the money lost through the inability of the truck to continue at work and earn profits for its owner. The issuance of the kit by the Autocar company takes rank as one of the most progressive steps ever taken by a motor truck manufacturer to give the owners of its trucks quick, inexpensive and efficient service.



Fig. 2—The Perfection rim tool designed to fit all split demountable rims and to remove tires on such rims without damage to casings or tubes. The arrow indicates the direction in which the handle is pushed to expand the rim. If moved in the opposite direction, the rim is contracted

Engine Air Purified by Bennett Cleaner

ALTHOUGH designed primarily for use on farm tractors to prevent access to the carbureter and engine of the sand and dust of the field, with their destructive abrasive action on the engine's wearing parts, the Bennett carbureter air cleaner can also be applied to motor trucks working in a dusty country. The device is made by the Wilcox-Bennett Carbureter Co., Minneapolis, Minn., and is characterized by its simplicity. It was used on some of the trucks of the United States expeditionary force which went into Mexico under the command of General Pershing.

The device consists of a cylindrical barrel with cone-shaped top and bottom. The air is taken into the barrel at two opposite points near the top of the cylindrical portion from where it is carried down to almost the bottom in two rectangular-sectioned tubes with open ends. These tubes contact with the inside of the barrel and follow its curvature, extending slightly more than half way round it, one curving down to the right and the other to the left, as shown in Fig. 5.

The dust and dirt is separated from the air on the principle of centrifugal force, in which all matter travelling in a circular path tends to leave that path and fly off at a tangent. In the air's circular path around the barrel from the top to the bottom of each tube the heavier particles of dust and dirt are thrown outward and directed downward to the bottom of the barrel, where they fall onto the surface of a metal cone, whose base is slightly less than that of the barrel in diameter. This cone is supported on small lugs on the barrel and leaves an annular open space around its base through which the dust deposited drops down into the base of

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the device, from which it is removed by unscrewing a simple cap.

While the particles of dust are thrown out toward the circumference of the barrel, the clean air tends to remain at the center, from where it is drawn up and out of the barrel through a pipe at the center of the coned top. The end of the pipe is connected with the air intake of the carbureter by means of a piece of rubber hose or pipe. There must be no leaks in this connection if the most efficient results are to be obtained.

The dirt collected in the bottom of the cleaner is removed by unscrewing the cap at the bottom, although this should not be opened while the engine is running. If this were done, the engine suction would lift the dust up off the bottom and carry it into the cylinders due to the opening of a direct draft between the cap hole at the bottom and the pipe at the top.

The advantages accruing from the use of air cleaners on engines of trucks working in dusty territory are that they prevent the grit from getting into the cylinders, scoring the cylinders, pistons, piston rings, pitting the valves and scoring the bearings, all of which make for heavy repair bills. In many cases, the grit taken into the cylinders with the air also gums up the oil used in the lubricating system so that it must be replaced often to prevent overheating and excessive wear of the engine.

Prest-O-Grip Non-skids for Truck Tires

PRESTO-O-GRIP non-skid tire chains for motor trucks consist of a series of cross chains with lock links at both ends which are inserted in special clamps around the wheel spokes, these clamps remaining in place even when the cross chains are not used. They are made by the Rowe Calk Co., Plantsville, Conn., and are offered in twelve different sizes for single or dual tires with cross chains from 14 in. to 30 in. long, and with sixteen different forms of wheel clamps to fit the spokes of various makes of wheels.

In use, one cross chain and its spoke clamp are attached to each alternate

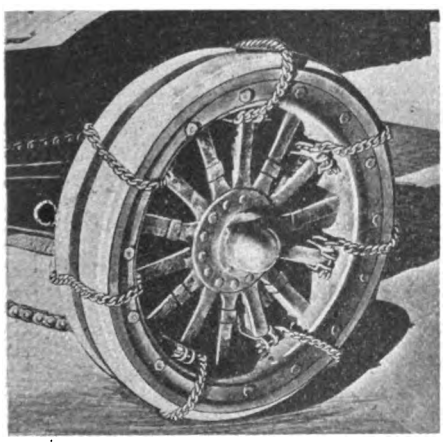


Fig. 3—The Prest-O-Grip non-skid tire chain as shown applied on the rear wheel of a motor truck. The cross chains are held in clamps attached to alternate spokes directly under the felloe. The clamps remain in place when the chains are removed

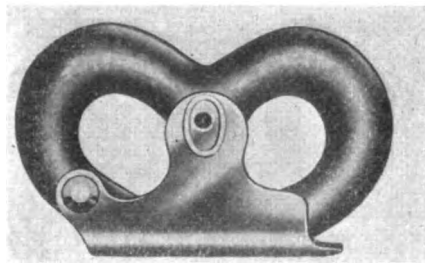


Fig. 4—The locking link of the Prest-O-Grip tire chain. The grooved, T-shaped bridle is pivoted to the chain at the left end and is held in its closed position as shown by a small indentation on the bridle and a corresponding projection on the center of the link

spoke, so that with the usual fourteen-spoke wheel seven cross chains are employed.

Due to the fact that the clamps are permanently secured to the spokes and the cross chains merely snapped in place when necessary, it is but the task of a few moments to attach them. Since each chain is applied as a unit, this may be done easily. If stuck in the mud, it is not necessary to jack up the wheel, as with some types of non-skid devices, but simply to apply as many cross chains as possible, and rely upon these to give the wheel sufficient traction to extricate itself when the engine is started. Due, however, to the permanent anchoring of the ends of each cross chain, these do not creep to any appreciable extent to prevent the chains from contacting with the same tread area, as would be desirable were the trucks to operate continuously for any considerable period with the chains in place. Under such a condition, it might be advantageous to shift the clamps to the alternate spokes every 4 or 5 days. If one chain should wear through and break, it alone need be removed, leaving the others to give sufficient traction.

The clamps are made of flat bar stock malleable iron in two parts, with a lug at each side for thumb screws, by which they are tightened around the spokes, and with an inverted-U member on one part through which the locking link of the cross chain is inserted.

The cross chains are made of steel, with the links twisted so that they will lie flat on the tire tread. The locking links on both ends of each chain are made of carbon steel, heat treated. They are in the shape of a figure 8 laid on its side, but with the portion between the loops of the 8 cut away on one side and closed by a bridle pivoted to one end of the link. In section, this bridle is trough-shaped to fit snugly over the sides of the chain. In side view it is T shaped, the base of the T having a small indentation which registers with a small projection on the link when the bridle is slightly spread in forcing it down over the link. In this way the bridle is kept closed so that the chain cannot become unlocked. It is opened by inserting the end of a screwdriver or similar object between the bridle and the link. The locking link and the entire set of chains as applied to a truck wheel are shown in Figs. 3 and 4.

Pages 10 and 11
This Issue
Will Make Money
for You

One Tool for All Split Demountable Rims

EASILY adjustable to fit any one-piece split demountable rim for pneumatic-tired vehicles, the Perfection rim tool, made by the A. & A. Co., Minneapolis, Minn., is designed to enable tires to be removed without damage to casing or tube. It consists of two flat bars with pivoted hooks at one end of each, and with a series of four holes at the other, together with a bent handle bar and thumb screws inserted through the holes in the flat bars to form a unit.

In operation, the hooks on the ends of the flat bars are slipped over the edges of the rim, as shown in Fig. 2, and the handle then used as a fulcrumed lever to contract the rim by moving it in one direction and to expand the rim again to the proper size after the tire has been repaired by moving it in the opposite direction. The series of four holes in each of the flat bars enable the bent handle to be joined to them at different points to correspond with the different diameters of rims.

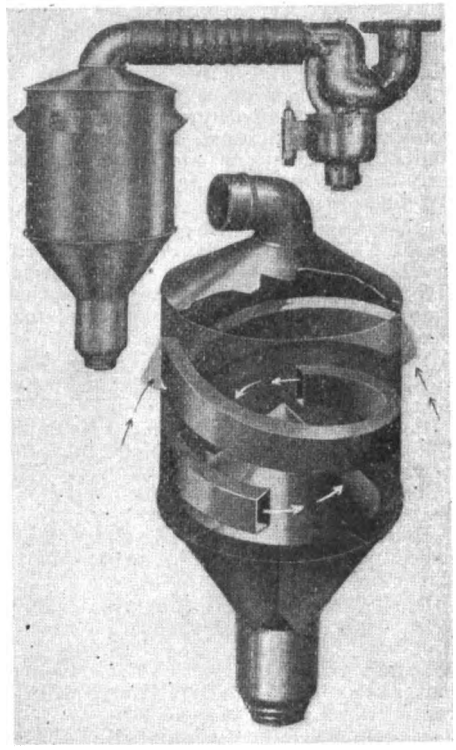


Fig. 5—Two views of the Bennett air cleaner to extricate dust and dirt from the air fed to the engines of motor trucks used in dusty country. The view at the top shows how it is attached. The broken-away view at the bottom shows how the dust is thrown out to the sides of the barrel by centrifugal force

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Men and Makers



PIERCE-ARROW MOTOR CAR CO., Buffalo, N. Y., has let contracts for the erection of a four-story factory, 60 by 100 ft., at its plant at Elmwood Avenue and the New York Central Railroad Belt Line.

Dodge Brothers Motor Co., Ltd., Windsor, Ont., has been formed to manufacture Dodge motor vehicles. A factory will be erected in the near future. The company has a capital stock of $100,000, held by J. F. Dodge, H. E. Dodge, F. J. Haynes and others, all of Detroit.

Fulton Motor Truck Co., Farmingdale, N. Y., has again raised the number of trucks it expects to turn out in 1917 by announcing a 2500 vehicle schedule. The original plans called for 1000 this year. This estimate was doubled about a month ago. Six units of the factory, each 20 by 150 ft., are now in use. The total floor space, which will cover over an acre, will be ready for use within three weeks.

Willys-Overland Co., Toledo, Ohio, has had an increase of over 212 per cent in business in its western branches for January, 1917, as compared with business for January, 1916. The company will erect a forge plant 500 by 200 ft.

Studebaker Corp., Detroit, has made a number of motor vehicles for the government. These are being tried out in New Mexico and have been found to maintain a speed of 25 m.p.h. Each car contains two machine guns, 20,000 rounds of ammunition, tools, water, gas and oil, field rations and seven passengers besides the driver, a total weight of 2½ tons.

Ross Engineering Co., Detroit, formed by E. T. Ross, will manufacture a light truck, according to report in authoritative circles. The same report says that bids have been asked on parts and materials for 50,000 trucks.

Dorris Motor Car Co., St. Louis, Mo., is planning to increase its output 50 per cent.

Peerless Motor Car Co., Cleveland, Ohio, has completed arrangements for new buildings which will afford practically 500,000 sq. ft. of additional floor space.

Denby Motor Truck Co., Detroit, is making plans for building expansion to triple the company's present output.

Oneida Motor Truck Co., Green Bay, Wis., expects to start production by the first week of April. The company has been assured of deliveries of parts and materials so that the first trucks will be coming through by May 1.

Stegeman Motor Car Co., Milwaukee, Wis., manufacturer of Stegeman six-cylinder motor trucks, has increased its capital from $100,000 to $200,000 preparatory to occupying factory additions which will increase the capacity nearly fourfold. Oscar Stegeman has taken over the interests of Joseph C. Millmann, former secretary and treasurer of the company. The new office and engineering building of the company has been completed, and the machine and assembling shop additions to the plant are expected to be ready by the middle of April.

Krebs Commercial Car Co., Clyde, Ohio, has been sold to Massachusetts interests. C. R. Dunbar, Holyoke, Mass., Charles H. Bowker, Northampton, Mass., Walter P. Dodger, Springfield, Mass., George W. Bradburn, South Lea, Mass., and J. B. Crockett, New York City, are the persons concerned in the deal. Louis Krebs and Harmon B. Ayres retain their interests.

Moreland Motor Truck Co., Los Angeles, Cal., held a 3-day convention of its distributors, dealers and salesmen during the middle of March to prepare for the big spring drive in the industry. About 100 attended.

Foreign agents for the Rainier have been appointed by the Rainier Motor Corp., New York City, as follows: Chipman, Ltd., Sydney and Auckland, for Australia and New Zealand; Bergens Automobile Co., Christiania, for Norway; Brune Kassman, Stockholm, for Sweden; Amerikaanisch Technisch Bureau, Amsterdam, for Holland; and André Weil & Co., Paris, for France.

The Motors Co., Baltimore, Md., has added the D-E line of trucks to its distributing activities. It has been handling the Atlas truck for some time.

Maxwell Motor Sales Corp., Philadelphia, Pa., has opened a sub-branch and service department in Camden, N. J.

Shelton-Scheele Motor Co., Davenport, Iowa, has been appointed distributor for Jeffery trucks in eastern Iowa and has opened new salesrooms at 418-420 Main Street.

Service Truck Co., Milwaukee, Wis., State distributor of Service trucks, has opened salesrooms and a service station at 553 Broadway under the management of B. F. Blaney.

McKinney-Fuller-Curtis Co., Grand Forks, N. D., has been appointed distributer for the Smith Form-A-Truck in North Dakota, eastern Montana, the northern half of South Dakota and several counties in Wyoming and western Minnesota. The firm has opened a new branch in Fargo, S. D., and is at present erecting a new building for its business at Grand Forks.

Vesper-Buick Automobile Co., St. Louis, Mo., has stated that it will contract for a new two-story building, 103 by 144 ft., at the corner of Lindell Boulevard and Grand Avenue. The structure will be erected by the Mercantile Trust Co., and the building is to be planned under the direction of F. W. A. Vesper.

Chilcott-Nash Co., Seattle, Wash., has been formed to distribute Jeffery trucks and other products of the Nash Motors Co. in the Northwest.

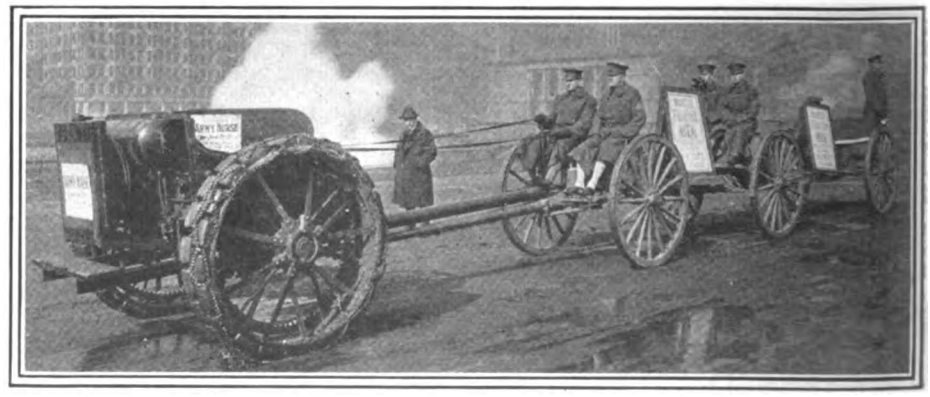
Samson Motor Co., Pittsburgh, Pa., will distribute Maxwell motor vehicles in that territory.

Swain-Hickman Co., Philadelphia, Pa., Republic truck dealer, has moved to 2116-18 Market Street.

Hartford Buick Co., Hartford, Conn., is remodeling the Park Casino, which it recently purchased and will use shortly as salesrooms. The front of the building has been torn out and large plate-glass windows are being put in.

Harry Newman, Inc., St. Louis, Mo., has opened a branch to handle Kissel trucks at Olive Street and Lindell Cut-off.

Johnson Motor Co., Fond-du-Lac, Wis., State distributor of the Inter-State, has opened a branch office and display room at 616 Grand Avenue, Milwaukee. F. A. Johnson will divide his time between the Fond-du-Lac and Milwaukee establishments.



This is neither Old Dobbin nor Black Beauty, although it is driven by reins. It is the Line-Drive tractor in the service of the United States artillery, recruiting district of Chicago. Sergt. Harry Springer with a complete gun crew of soldiers mans the outfit. Capt. F. R. Kenney, commanding officer of the district, has endorsed this device as an efficient substitute for the horse in hauling artillery. This novel tractor is made by the Line-Drive Tractor, Inc., Milwaukee, Wis.

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Walt Automobile Co., Milwaukee, Wis., as been appointed local dealer for the ıter-State.

Lewis Automobile Co., Bellingham, 'ash., has taken the agency for G. M. C. ucks.

H. H. Babcock Co., Watertown, N. Y., as secured a contract to supply 500 am- ılance bodies for motor trucks for the ar department of the United States overnment. The order was placed with- ıt competitive bidding, after a sample ad been tried out by the medical board f the army. The contract calls for de- very within 6 months and will require ıe operation of the plant at full capac- y until Aug. 1. The company took the rder on the basis of a very reasonable rofit, in accord with the policy affirmed y many manufacturers to sell to the overnment at as low a rate as possible.

C. R. Wilson Body Co. will erect a lant at Bay City, Mich., to be completed y June 15. The cost with equipment is stimated at $250,000. The addition is xpected to increase the entire capacity f the Wilson plant to over 800 bodies er day.

Barnett Auto Body Co., San Francisco, 'al., manufacturer of commercial bodies or Ford cars, has opened a plant at and emoved their offices to 430 Golden Gate Avenue, San Francisco.

Firestone Rubber Co., Akron, Ohio, has old stock of the company to over 11,000 f its employees, or more than 90 per ent of the working force of the com- pany. This stock was sold below cur- ent quotations on an easy payment plan.

Goodyear Tire & Rubber Co., Akron, Ohio, is erecting a mechanical goods fac- ory building which will add 11 acres of floor space to the total factory area. The new structure is 500 by 200 ft., five stories high, and the largest building in the Goodyear group.

Goodyear Tire & Rubber Co., Akron, Ohio, has declared for the metric system of weights and measures and will adopt its use as far as possible in all its work. All employees have been asked to famil- iarize themselves with the system.

Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., manufacturer of cylinder castings, will erect a factory to cost over $100,000 on the site of the plant which recently burned.

Chelsey Screw Co., Chelsey, Mich., has secured a large contract from the Max- well Motor Car Co. and is arranging to run its plant on a day and night shift.

Your Best Truck Repairs
See pages 10 and 11

Perfex Radiator Co., Racine, Wis., maker of radiator and cooling systems for trucks and other motor vehicles, has awarded contracts for a large addition to its plant.

Staybestos Mfg. Co., Germantown, Pa., has increased its floor space 50 per cent. The firm manufactures brake linings.

Silvex Co., South Bethlehem, Pa., has placed an order for more screw machines, which will enable it to turn out 30,000 Bethlehem five-point spark plugs per day.

Western Coil Co., Racine, Wis., has purchased the former Main telephone exchange at Racine and will start production of electrical appliances for motor vehicles about April 15. The company was recently organized by James W. Gilson, formerly a prominent official of the Mitchell-Lewis Motor Co., now the Mitchell Motors Co., Racine.

Auto Hardware & Equipment Co., New York City, has been made eastern distributor for the Standley Skid Chain Co., Boone, Iowa, maker of the truck non-skid device of the same name.

Post & Lester Co., Hartford, Conn., has been appointed distributor of S K F ball bearings for New England.

John M. Studebaker, honorary president and general manager of the Studebaker Corp., Detroit and South Bend, Ind., died in his home at South Bend, March 16. He was one of the Studebaker brothers who made the family name famous as wagon builders, and later went into the motor vehicle business. Mr. Studebaker was born near Gettysburg, Pa., Oct. 10, 1833, the son of a blacksmith. As a young man he learned his father's trade. He manufactured wheelbarrows for miners in the early days of California pioneering, and by this made $7,000, which in 1858 he invested in the wagon business in South Bend which had been started by his brothers. Although the motor vehicle business developed when he was well past middle life, Mr. Studebaker was actively interested in motor vehicle production. He urged the purchase of the E. M. F. and Flanders companies by the Studebaker Corp. He was the largest individual shareholder of the corporation at the time of his death.

W. H. Brown, vice-president and treasurer of the Kelley Convertible Auto Truck Co., Chicago, died March 19.

Hector C. Adams has been appointed manager of motor truck sales for the Packard Motor Car Co. of New York. He was formerly manager of the Philadelphia branch of the International Motor Co.

R. S. Oberlin has been appointed purchasing agent for the Denby Motor Truck Co., succeeding K. A. Morrison.

R. G. Shuert has been appointed factory manager for the Acason Motor Truck Co. of Detroit. He was formerly production engineer with the Indiana Motor Truck Co., Marion, Ind.

J. J. Hartley has been appointed manager of the Dorris Motor Car Co. factory at St. Louis, Mo. Mr. Hartley has been for the past 4 years with the Wagner Electric Co.

Maurice Needham has joined the staff of Barrett-Cravens Co., Chicago, manufacturer of the Barrett multi-truck. He was formerly treasurer and general manager of the Bailey Non-Stall Differential Corp.

L. Van Buskirk has been made manager of the Studebaker branch in Syracuse, N. Y. He is organizing a sales and service station force preparatory to making the branch the distributing center for New York State.

L. G. Peed has been appointed sales manager for Willys-Overland Co., New York.

O. B. Henderson has been appointed permanent manager over the Los Angeles territory of the Willys-Overland Co.

R. B. Parker has been made general manager of the Packard Motor Car Co., Providence, R. I., Worcester, Manchester and Haverhill, Mass. He was formerly assistant to A. T. Fuller, manager of the Boston branch of the Packard company.

E. J. Naylor has been appointed traffic manager of the Vesper-Buick Auto Co., St. Louis, Mo. He was formerly with the Chicago & Alton Railway. This office is an innovation in the distributing line, as far as St. Louis is concerned. Mr. Naylor's duties will be to get the products from the factory and see to their safe distribution to the sub-dealers located southwest of St. Louis.

Elmer F. Twyman, Jr., has been elected vice-president, treasurer and general manager of sales for the entire ter-



When the railroad brotherhoods threatened to tie up transportation, the nine Kissel trucks in the picture above started from the factory at Hartford, Wis., as a relief corps to Baltimore, Md. Under the dark shrouds are concealed Kisselkars. The fleet is well along in its 1200 mile journey as this magazine goes to press. It has passed through Pittsburgh, Pa., and reports that roads are oozy, but passable to those putting through a stunt like this. It is a good example of the possibility of overland haulage

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ritory, twelve states, of the R. E. Taylor Corp., New York, sole eastern distributor of Gramm-Bernstein motor trucks. Mr. Twyman has been manager of the corporation's Boston office for the past two years.

F. M. Randall has been appointed sales manager of the Hartwell Motor Co., Los Angeles, Cal., distributor of Nash Motors Co. products in Southern California. He has been with the sales force of the Nash company.

W. B. Chambers has joined the staff of R. E. Loughney Motor Co., Pittsburgh, Pa., Reo truck distributor. He has been assistant manager of the Philadelphia Maxwell factory branch.

W. A. Daley has been appointed manager of the Oakland, Cal., branch of the Moreland Motor Truck Co.

Charles Roach, Springfield, Ill., has been appointed distributor for Commerce and Federal trucks in Sangamon County.

Arthur E. Lindborg, Spokane. Wash., has been appointed manager of the G. M. C. truck department of the Northwest Buick Co.

George Duval has been placed in charge of the service department of the Philadelphia Sales Corp., Studebaker distributor in Philadelphia, Pa., and vicinity. He was formerly with the Studebaker factory.

George W. Bartlett has been made manager of the Syracuse, N. Y.. branch of the Binghamton Motor Sales Co., distributor of Velie products. He was formerly sales manager for the C. A. Spear Motor Co., Syracuse.

Harvey Robinson has joined the sales force of the Harrolds Motor Car Co., New York, distributor for Pierce-Arrow motor trucks. He has been with the Guaranty Securities Corp. and the New York Edison Co.

Ralph C. Hamlin, Los Angeles, Cal., has been appointed agent for the Selden truck in that territory.

G. E. Brunner has been promoted from assistant to manager of the service department of the Goodyear Tire & Rubber Co., Akron, Ohio.

Walter R. Bliss has been placed in charge of the New York district of the Goodyear Tire & Rubber Co. He has been manager of the Boston office.

R. S. Wilson has been appointed manager of the motor truck tire department of the Goodyear Tire & Rubber Co., Akron, Ohio. He was formerly manager of the service department.

C. W. Martin, Jr., has been named manager of the Southern district of the Goodyear Tire & Rubber Co., with headquarters at Atlanta. He has been associated with the organization as manager of the motor truck tire department.

H. O. Hench, Minneapolis, Minn., has been put in charge of the sales promotion department opened by the factory branch of the B. F. Goodrich Co.

Robert F. Brown has joined the staff of the Guaranty Securities Corp., New York, and will travel in New England in the interests of the Guaranty wholesale and retail plans.

R. Bissell has joined the research engineering staff of the Detroit Steel Products Co. He has been with Dodge Brothers for the past 3 years in a similar capacity.

H. L. Dickey has been appointed sales manager of the Moto-Meter Co., Inc.. Long Island City, N. Y. He was formerly with the Findeisen & Kropf Mfg. Co., New York.

A. H. Dittmer has been named purchasing agent of the Covert Gear Co., Lockport, N. Y. He was formerly comptroller of expense for the Chalmers Motor Co.

F. E. Mosher has been appointed secretary of the Covert Gear Co., Lockport, N. Y. He has been for some time general manager of the company.

J. L. Merritt has been appointed division manager of the Prest-O-Lite Co. at the Seattle, Wash., branch.

W. E. Darden has been made division manager for the Prest-O-Lite Co., with headquarters in Seattle, Wash. He will have charge of Oregon, Washington, Idaho, Montana and Alaska.

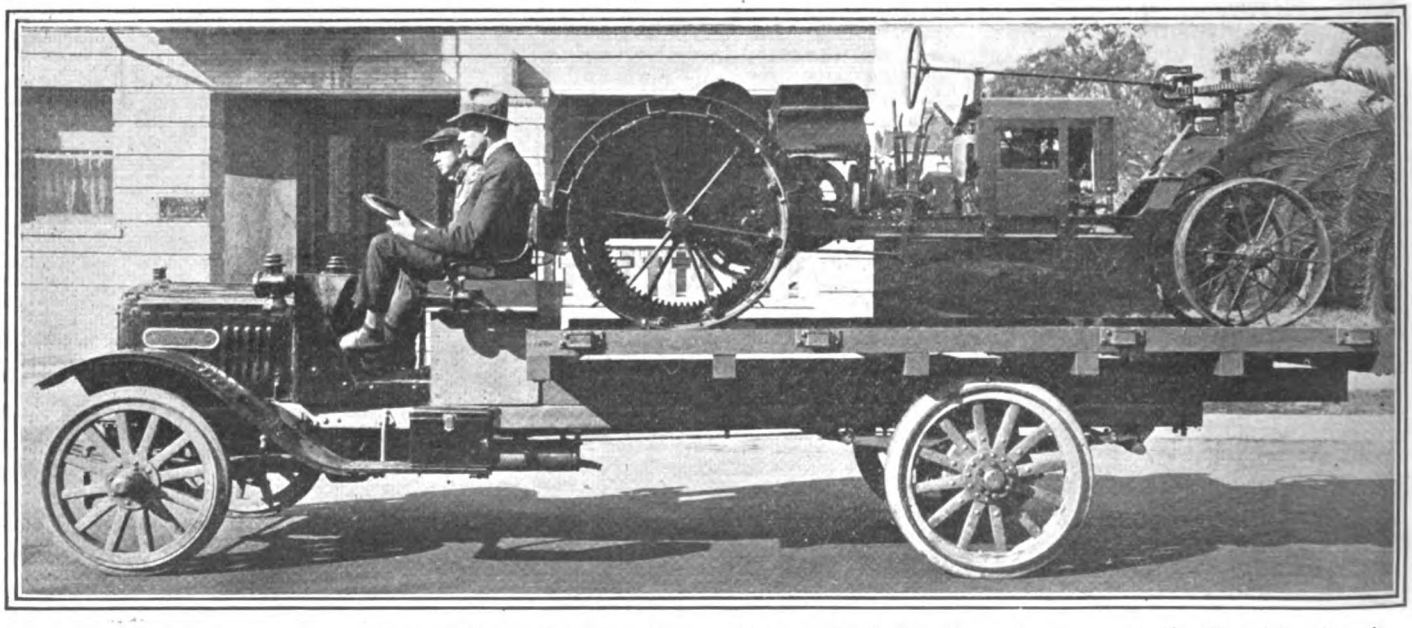
D. O. Pohlman and **H. F. Blanchard** have assumed new positions in the organization of the Thermoid Rubber Co.. Trenton, N. J. Mr. Pohlman has gone to the Chicago office as district manager. He was formerly sales manager. H. F. Blanchard has been made sales manager. He was formerly manager of the Philadelphia branch.

Frank B. Amos has joined the staff of the Johnston overseas advertising service of the *American Exporter*. He has been assistant sales manager and advertising manager for the foreign division of the Studebaker Corp. of America.

Nat Mallouf, treasurer of the Motor Truck Club, has resigned from the organization of the Harrolds Motor Car Co., New York City, for which he sold Pierce-Arrow motor trucks, to become sales manager and traffic engineer of the Motor Haulage Co., 7 East Forty-second Street, New York City. The Motor Haulage Co. operates a fleet of twelve trucks, which it rents out at daily rates or uses in carrying out contract haulage. Clinton Brettell, formerly in charge of a portion of the work which Mallouf has taken over, has left to enter the engineering field. Mallouf has been selling trucks in the Metropolitan territory for the last 10 years and brings to the Motor Haulage Co. a great wealth of truck and truck-operating knowledge.

Harry Tipper has been appointed manager of *The Automobile*, which is published by the Class Journal Co., New York. Mr. Tipper has been for 9 years advertising manager of the Texas Oil Co. and is president of the Advertising Club of New York. He assumes his new position May 1.

Willard S. Mears, formerly sales manager of the Sterling Motor Truck Co. of New York, which handled Sterling trucks in that city, has resigned to become the president and general manager of the M. C. W. Motor Sales Corp., Metropolitan distributor for D-E trucks, made by the Day-Elder Motors Co., Newark, N. J. The M. C. W. company is a brand new concern formed by Mr. Mears and other associates well known in the motor truck trade in New York City. The company has opened a temporary service station and salesroom at 208 West Sixty-eighth Street, which will be used until a larger service building can be built and put into operation.



Double advertising is secured by C. S. Anthony of Los Angeles, Calif., dealer in Signal trucks and Avery farm tractors by the means shown in the illustration above. Whenever a prospective customer wants a demonstration of the farm tractor, Mr. Anthony loads the Avery tractor on to the Signal truck and drives across country to the prospect's farm. This saves wear and tear on the tractor, illustrates the carrying power of the Signal truck, and eliminates railroad transportation delays

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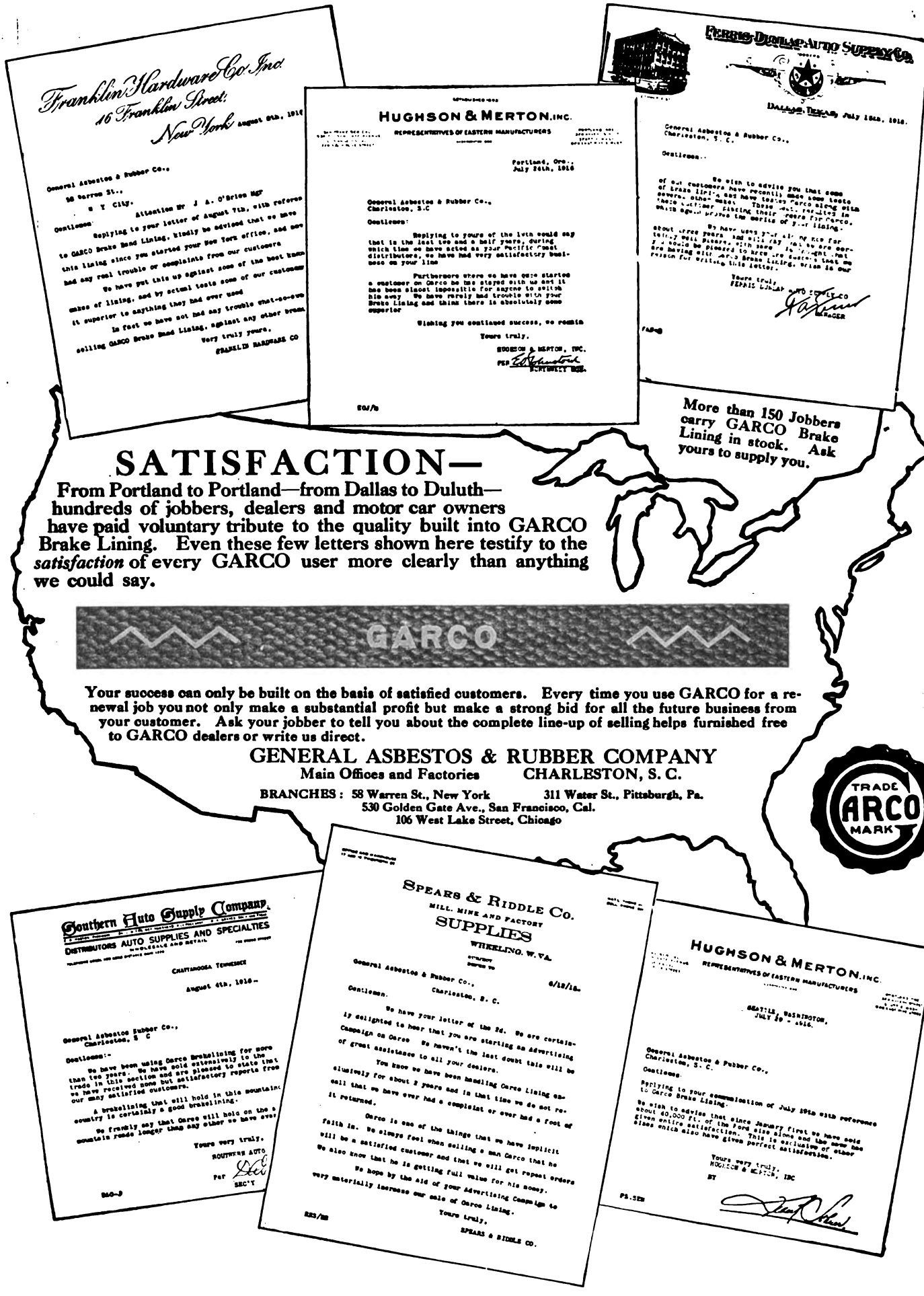


WHITE TRUCKS

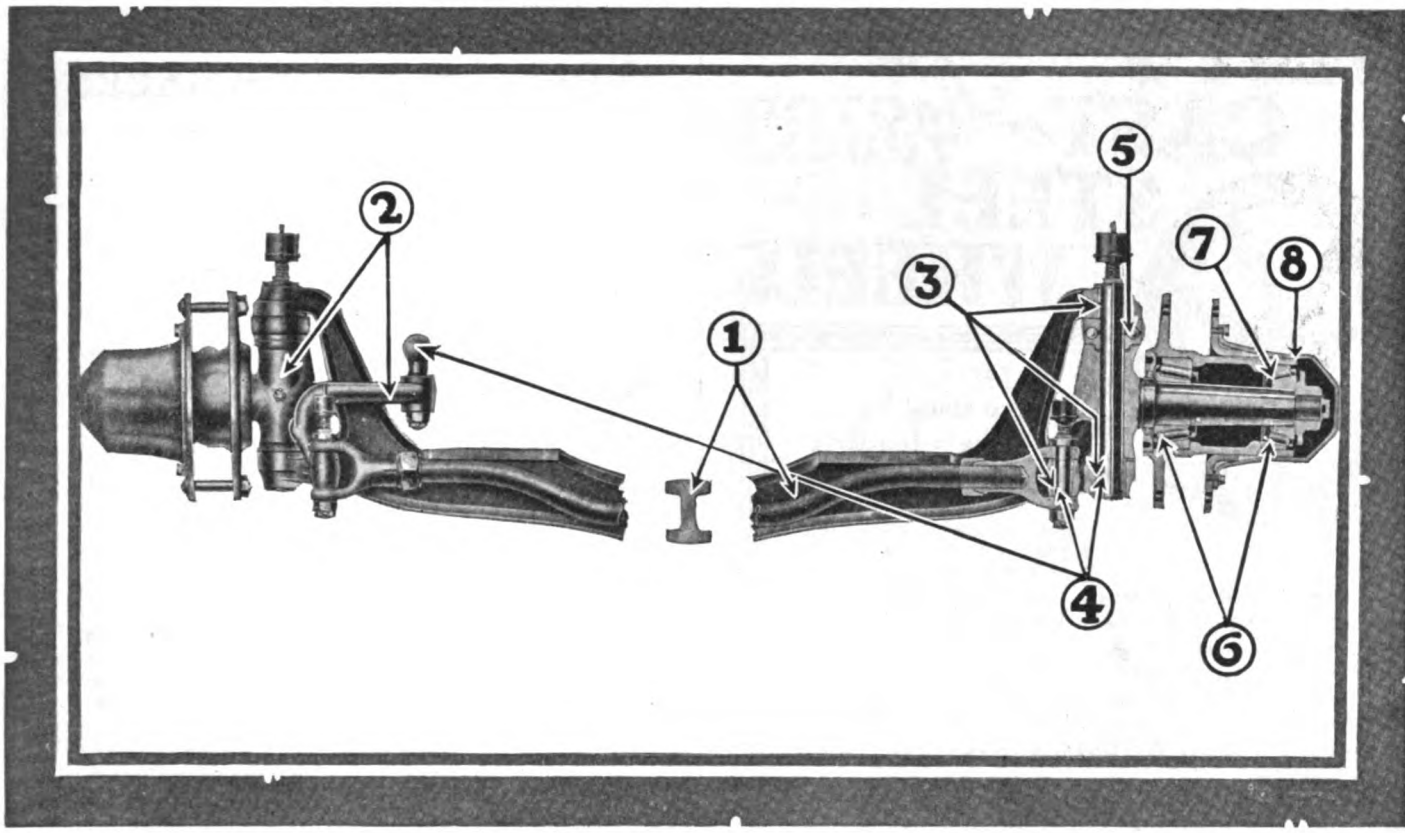
WHAT a truck actually costs is not known until you have operated it for some time. The purchase price is often insignificant when compared with the maintenance and operating bills. The largest users of trucks consider it far cheaper to invest more money in White Trucks and enjoy unfailing service and low expenses over a long period of years — than to buy medium-grade trucks, pay higher bills for less dependable service and stand more rapid depreciation on the investment.

THE WHITE COMPANY
CLEVELAND

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Why SHELDON Front Axles are Better Axles—

1. Heat-treated axle bed—drop forged in one piece—I-beam section—strong, yet light.

2. Steering levers and knuckles drop forged—3½% nickel steel—properly heat-treated.

3. All wearing surfaces protected by steel bushings.

4. Clevis Pins, Ball Pins and Pivot Bolts hardened and ground to size—extra large wearing surfaces.

5. Ball thrust bearings—make steering easy.

6. International series wheel bearings—two row ball-bearings, straight roller or taper roller-bearings, all interchangeable—single row annular ball-bearings can be used by employing spacer.

7. Extra large outer bearing—increases life of bearings and spindles—reduces upkeep cost.

8. Bolted on hub caps—outer bearing protected from injury in case of collision.

Sheldon Axle and Spring Company

Wilkes-Barre, Pennsylvania

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WEST'S CAST-STEEL WHEELS for MOTOR TRUCKS



"Patent Pending"

Are used by America's leading Truck Builders

These wheels were designed by, and are built under the supervision of, experienced engineers. They have been thoroughly tested and have proved they will stand hard usage and abuse.

Over 25,000 WEST'S CAST-STEEL WHEELS are now used on trucks and not one of them has failed to give satisfaction. Specify WEST'S CAST-STEEL WHEELS on every heavy truck you buy.

SATISFACTION GUARANTEED

The West Steel Casting Company

805-815 E. 70th St. Cleveland, Ohio

"Watch the West Cast-Steel Wheels Go Round"

"WHITNEY" Chains
ARE BUILT FOR STRAINS



We have recently completed another large addition to our factory in order to be of service to our customers and are now in position to make prompt deliveries on most sizes of roller chains.

Whitney Chains are strong, accurate and dependable. They are used by the leading makers of trucks throughout the country.

Insist on "Whitney" Chains when making replacements.

The Whitney Mfg. Co.
Hartford, Conn.

Chains, Keys and Milling Machines

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1½-3-5 and 7 Ton Sizes

DOUBLE end steering device of original design makes it not only possible but EASY to back trailer anywhere. Double swiveled tongue; no other trailer has it.

Also pole, semi, and pleasure car trailers.

Detroit Trailers are used by *Cadillac, Ford, Saxon, Reo, Jeffery* and other large auto concerns who know good trailers when they see them.

MONEY FOR DEALERS

The demand for trailers is increasing rapidly as you know. An agency for a good trailer is a good thing, and an Agency for the Detroit Trailer is the best proposition in the Trailer line.

Send for particulars

DETROIT TRAILER COMPANY, Inc.,
671-673 Atwater St., E., Detroit, Mich.
Branch for Canadian Trade—Walkerville, Ont.



Put

R & M Conform Piston Rings

On Your Fleet For Better Results

Lower cost of operation per ton mile, quicker pick-up, less friction, greater power, better compression and reduced wear, result when you equip your fleet with R & M Conform Piston Rings.

3-part construction. Will not leak. Install them on one truck, and you will want them on your entire fleet. *Write.*

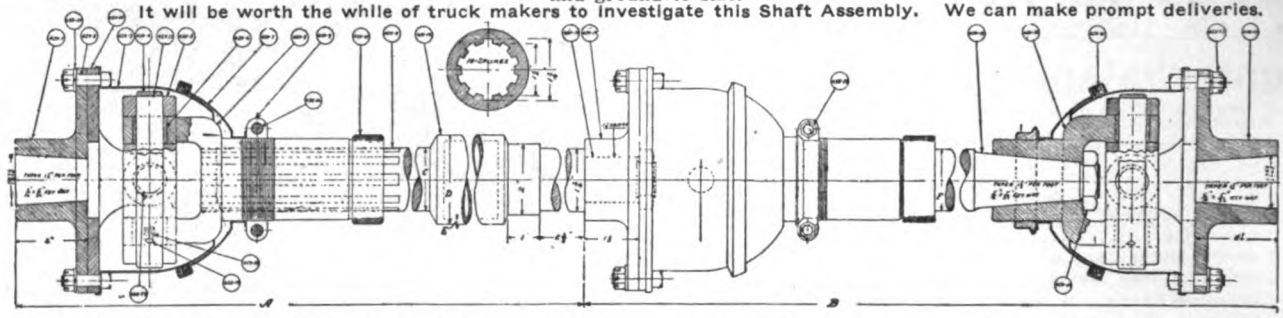
Modern Electric & Machine Co.
INDIANAPOLIS, INDIANA

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This is Our Three Joint Shaft Assembly, No. 450

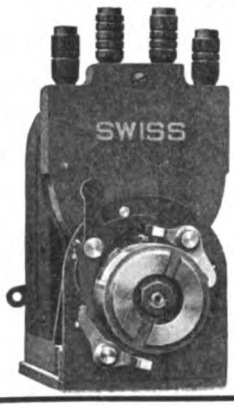
Built for heavy duty trucks of 2, 3 and 5 ton capacities. Made from drop forgings, heat-treated. All wearing parts are case hardened and ground to size.

It will be worth the while of truck makers to investigate this Shaft Assembly. We can make prompt deliveries.



THE KINSLER-BENNETT CO. Morgan & Market Streets HARTFORD, CONN.

Wherever You See The Swiss Magneto



in a motor truck you will know that the manufacturer of that truck has sacrificed some of his profit in order to give the owner the best ignition known. Don't let the manufacturer of your truck increase his profits at your expense by installing cheap, unreliable ignition.

The Swiss Safety Starting Coupling Absolutely Prevents Back Kicks from Pre-Ignition. It is the only coupling with which the impulse spring cannot interfere with the proper action of the magneto. Write us for Bulletin 5 Today.

SWISS MAGNETO COMPANY
MONROE, MICH.

DEALERS MAKE MONEY!

Get the agency for the "Tonford" truck unit—one of the quickest selling propositions you ever tackled. Attached to a Ford chassis, makes a one-ton truck. Light, strong, economical, easily handled. Drygoods merchants, furniture dealers, retailers in almost every line, bottlers, farmers, creameries, all want it. Find it best possible buy.

$325 Tonford $325
TRADE MARK

All the facts that sell the Ford, sell the Tonford. Highest grade truck attachment made—easiest to attach—strongest, most durable. Best constructed truck unit on market—lowest priced. Get busy now, while territory is still open. Write today. Learn how "Tonford" dealers pile up profits.

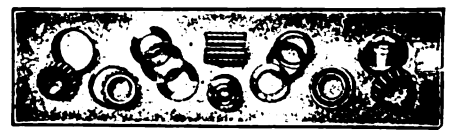
DETROIT TRUCK COMPANY, Mfgs., Detroit

Empire Worm Drive Axles of accepted design are built for Commercial Vehicles ranging in capacity from one to seven tons pay load.

Special **Empire Worm Drive Axles** are made also for Electric Pleasure Cars, Electric Trucks, Gasoline Fire Trucks, Armored Trucks and Industrial Trucks.

EMPIRE AXLE COMPANY
DUNKIRK, NEW YORK

Ball and Roller Bearings For Immediate Delivery
The New Departure Service Station **THE GWILLIAM COMPANY**



Engineers and Specialists in Bearings
New York: 253 West 58th St. (at Broadway)
Philadelphia: 1314 Arch St.

The Gas Engine Handbook

By E. W. ROBERTS

Seventh Edition! Entirely Rewritten!

Price $2.00, Postpaid

Book Dept., The Commercial Vehicle, 231 W. 39th St., N.Y.

CHAMPION
DROP FORGINGS



DETERMINATION!

Consider the Bull Dog. He is the embodiment of determination, for he generally does what he undertakes to do. Champion delivered-on-time Forgings satisfy rigid requirements, because back of them stands an organization determined to produce only such forgings. But at a sensible cost.



New York Office: 30 Church Street
Chicago Office: Monadnock Blde.

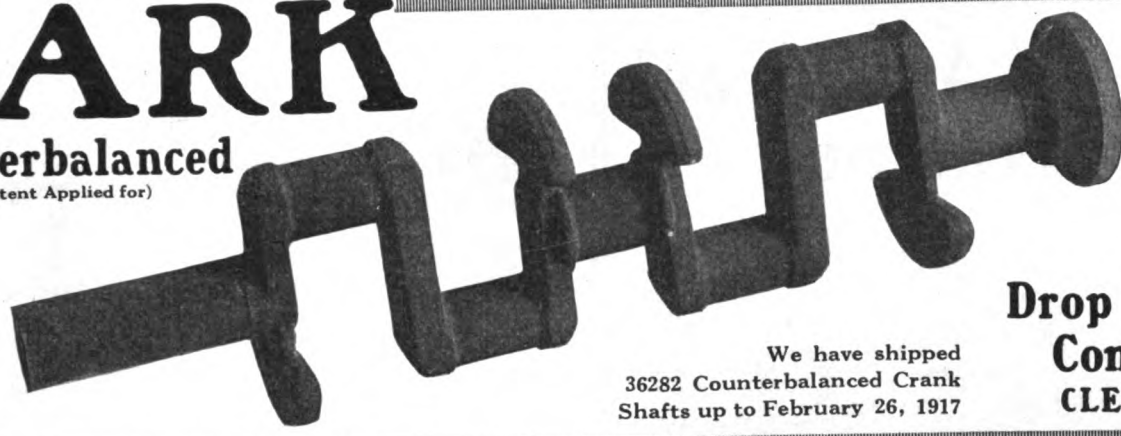
The Champion Machine & Forge Co.
CLEVELAND, OHIO

Philadelphia Office: Bourse Bldg.
Detroit Office: H. B. Kendal, 56 Cadillac St.

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PARK

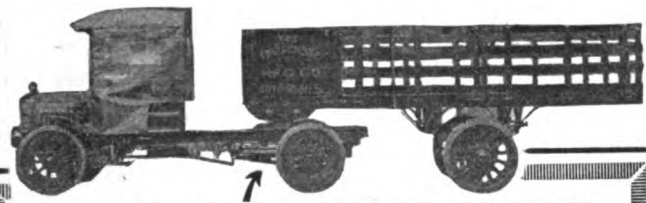
Counterbalanced
(Patent Applied for)



We have shipped
36282 Counterbalanced Crank
Shafts up to February 26, 1917

The Park Drop Forge Company
CLEVELAND

One-Ton with Three-Ton Efficiency



The MARTIN FIFTH WHEEL
makes possible this combination of a 1-ton Packard and a 3-ton Fruehauf trailer.
Write for further information
MARTIN ROCKING FIFTH WHEEL CO.
SPRINGFIELD, MASS.

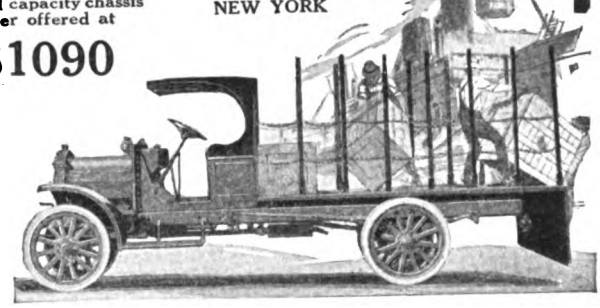
THE FULTON TRUCK

Dealers—*Write for territory still open*

Fulton Motor Truck Co.
Farmingdale, Long Island
NEW YORK

The first full 3000-pound capacity chassis ever offered at

$1090



Quality in Motor Trucks

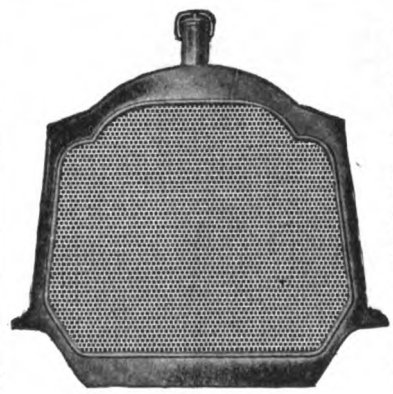
It has been our endeavor to create a commercial vehicle that would excel first of all in the quality of the material used, and second, in the economy of its operation.

Our reputation for producing the most lasting truck is recognized by our many users.

We offer for your convenience the following sizes:

1½ ton, 2 " , 3½ ton, 5 " , 7 ton

HURLBURT MOTOR TRUCK COMPANY
133rd St. & Harlem River
NEW YCRK, N. Y.



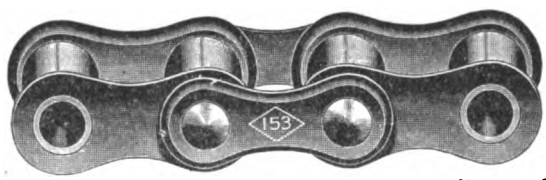
Fedders Radiators

Fedders quality is largely the result of 18 years' specializing in radiator production.

Fedders Manufacturing Co.
Buffalo New York

CULLMAN SPROCKETS

in stock and to order.



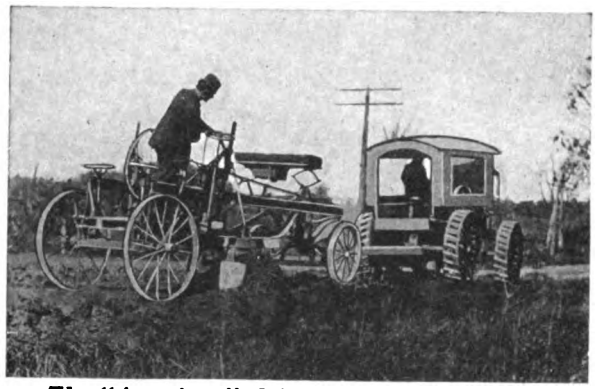


For Block, Roller and High Speed Silent Chains.
New Catalog.

Cullman Wheel Co., 1350 Altgeld St., Chicago

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Lenox "American" Tractor



The "American" doing practical road work

SPECIAL ADVANTAGES

4-wheel drive, 4-wheel steer, light weight, extreme flexibility and unusual amount of horsepower actually delivered at the drawbar.

Catalogue and prices on request.

Manufactured by

LENOX MOTOR CAR COMPANY
BOSTON, MASS.



WICHITA TRUCKS

Dependability Plus Service

We want a Dealer with energy and spirit,—we want one who will make the co-operation with him of our factory organization worth our while, and his. We want men who can interest concerns in our heavy-duty trucks and then not let up until they sell them.

If you are such a Dealer we have an interesting selling proposition that will interest you immensely.

Besides the WICHITA 3½-ton capacity truck, we have a 2½-ton and a 5-ton truck—both worm driven.

Write us for our plans.

WICHITA FALLS MOTOR COMPANY
Arthur Boulevard, Wichita Falls, Texas

AGENTS WANTED



"Little Giant" in the service of the Inland Steel Company

Owing to territorial adjustments we now have several money making territories open to live agents. If you want to connect with a progressive motor truck manufacturer who backs his guarantee with $12,000,000.00 capital, who has had twenty-five years manufacturing experience and who has 25,000 satisfied customers in the United States

Here is Your Opportunity.

The "Little Giant" Line Includes

Little Giant Convert-a-Car.
(Converts any Ford into a one ton truck)
Model 15—1 Ton Worm Drive
Model 16—2 Ton Worm Drive
Model 17—3½ Ton Worm Drive

SPECIAL BODIES FOR EVERY PURPOSE

Write for Prices, Specifications and Terms

CHICAGO PNEUMATIC TOOL CO.
615 Little Giant Building CHICAGO
Branches and Service Stations Everywhere

AUTOMOBILE REPAIRING MADE EASY

By Victor W. Pagé, M.E.

1000 Specially made Engravings on 500 Plates. 1056 Pages (5½ x 8). 10 Folding Plates.

A Comprehensive, Practical Exposition of Every Phase of Modern Automobile Repairing Practice.



THE COMMERCIAL VEHICLE
241 W. 39th St., New York City

Strong—Sturdy—Wonderful

METZ

HIGH-DUTY ONE TON TRUCK

$695

METZ COMPANY
WALTHAM, MASS. U. S. A.

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transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

BROWN-LIPE GEAR CO.
SYRACUSE, N. Y., U. S. A.

BROWN-LIPE CHAPIN CO.
Differentials Transmissions

NEW YORK—Thos. J. Wetzel, 29 West 42d St.
SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C

MACCAR

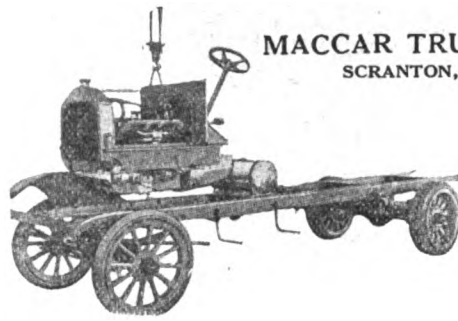
Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.

If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.

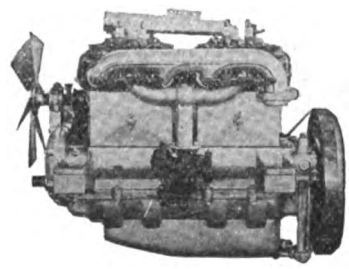
The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.

Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.



MACCAR TRUCK CO.
SCRANTON, PA.





Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications

BEAVER MFG. OOMPANY
Milwaukee Wisconsin

THOMAS TRUCKS
BUILT IN NEW YORK

The Thomas is keyed to do things a little better than the best—it has a mission beyond the ordinary. What you know about other trucks is no guide as to what your customers can expect from the Thomas.

The Two Ton Worm Drive

YEARS AHEAD

Dealers—write for specifications and open territory

THOMAS AUTO TRUCK CO., Inc.
Factory and General Offices
639 W. 51st Street, New York City

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CORLISS

Half-Ton Light Delivery Trucks Are Most Economical

The lowest cost of operation per ton-mile insures the greatest returns per dollar invested, from any motor truck.

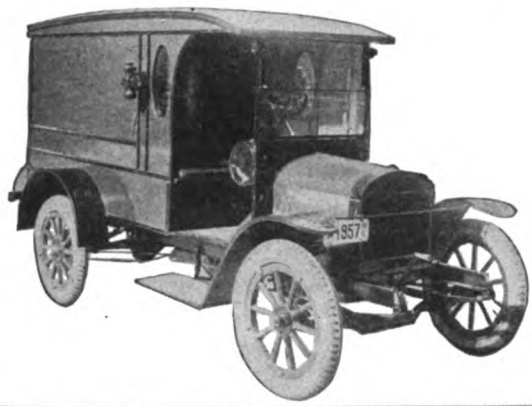
The CORLISS is the most economical truck in its price class. Carefully constructed with parts you know, including Le Roi Motor, Schebler Carburetor, Dixie Magneto, etc.

Write for catalog with complete specifications and illustrations.

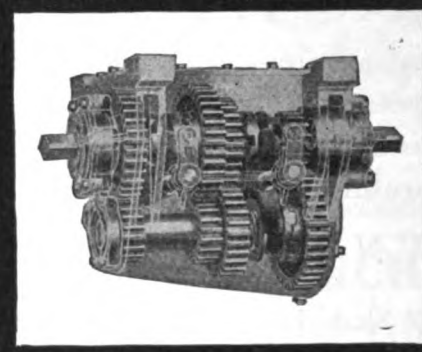
Panel Body $695

CORLISS MOTOR TRUCK CO.
Corliss, Wisconsin

Express Body $675



COTTA TRANSMISSIONS



All Gears Always in Mesh

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

Are You the Man?

We are desirous of obtaining the services of a capable man to fill the position of sales director of our sales organization.

We feel that every successful motor truck organization must have in its make-up an assistant to the executive head of such a company, who is probably equally capable and who if given an opportunity would make good.

If you are the man who can demonstrate your ability communicate with

A. O. BOX A-58
Commercial Vehicle

FOR SALE:

Ten chasses complete equipped with 4 cyl. 3¼ x 4¼ Golden, Belknap & Swartz motor, with Splitdorf Dixie magneto, sliding gear transmission, full floating rear axle, 31 x 4 wood artillery wheels, 112 inch wheel base. Suitable for light pleasure or delivery car. Also fifty sets of fenders and splashers.

Address

W. H. JOHNSON

414 Neville Street, Pittsburgh, Pa.

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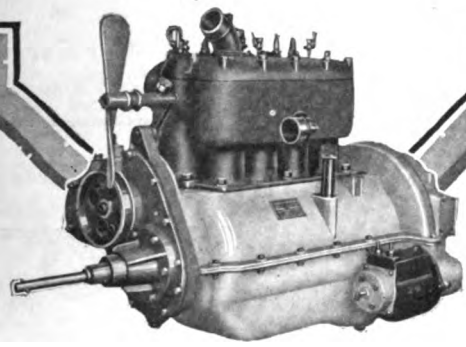
LYCOMING MOTORS

THE BIG POINT about the Lycoming Motor is its general excellence.

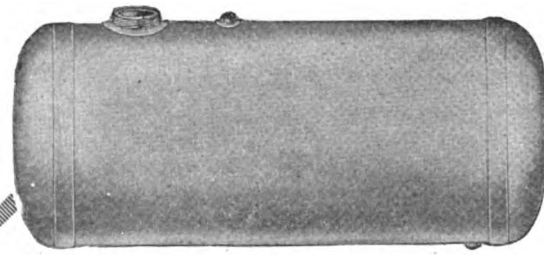
Every bit of metal is of the highest quality, carefully machined to exact dimensions; every part is exactly fitted and thoroughly tested.

Unusually well made, of the best material obtainable, these motors will last for years, giving uniformly excellent service.

Lycoming Foundry & Machine Co.
Williamsport, Pa.



TRAGESER TANKS



GUARANTEED

These tanks are made of No. 16 gauge steel, are tinned inside and outside by the hot process, guaranteeing a perfect coating. The seams are welded. The filler cap and outlets are all brass, insuring a tank that will outlast the car.

Made in all sizes.

Write for catalogue.

John Trageser Steam Copper Works
447-457 West 26th Street NEW YORK CITY

U. S.

U. S. Ball Bearings

are essential to the continued satisfaction of your car.

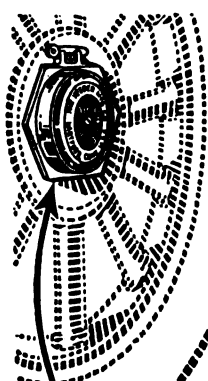
U. S. Ball Bearings have proved their ability to transmit all the power you pay for and to minimize the upkeep of your car.

At axle ends, on steering knuckle heads, in each side of the differential, next to the driving pinion and in the transmission; in fact, everywhere bearings are used in a car, U. S. Ball Bearings are giving dependable and lasting satisfaction.

Made to meet every possible radial, combined and thrust load.

Write for Catalog F. It will give you full and detailed information.

U. S. BALL BEARING MFG. CO.
(Conrad Patent Licensee)
Palmer St. and Kolmar Ave., Chicago, U. S. A.



Delivery Cost

is a part of your overhead too apt to be guessed at. But it is just as essential that you increase your efficiency in this as in your manufacturing. Your truck cost records should be accurately kept. A

Veeder Hub Odometer

gives you the *exact* mileage. It is absolutely accurate and can not be tampered with. And accurate mileage is essential for accurate truck records. Get Veeder Hub Odometers for your trucks and know your delivery costs and where they can be reduced.

Price complete $20. Special model for Ford Cars, $15.

Cyclometers for Bicycles and Motorcycles. Odometers for Automobile and Horse-drawn Vehicles. Counters for practically every purpose. Tachometers, Tachodometers and Fine Die Castings.

Veeder Mfg. Co.
54 Sargeant Street Hartford, Conn.
New York Representative—Joseph T. Quinlan, 1777 B'way
Chicago Representative: C. G. Wirick Co., 617-619 Fulton St.

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On account of freight car shortage and railway congestion this fleet of International Motor Trucks was driven overland from Akron Works to Buffalo



INTERNATIONAL

Motor Trucks Continue in First Place!

THESE are the trucks of which there are more at work than of any other line of motor trucks made—a remarkable record. This year the factory and output are to be more than doubled to meet the fast-growing demand. At present the 1917 sales are three times as great as for the corresponding period in 1916.

International trucks are popular because for years they have been saving and making money for men who have material and supplies to transport. They will handle **your** hauling rapidly and economically, in the right size and style of tried-out motor trucks, giving day-in day-out service, making the best impression through both appearance and reliable performance. **Here** is better business for you! Consider these

LOW-PRICE INTERNATIONALS

Model H—1500 lbs. capacity, internal gear drive (chassis) $1225

Model F—2000 lbs. capacity, internal gear drive (chassis) $1500

Prices cash f.o.b. factory

Eighty-nine company branches and thousands of local distributors cater to the needs of **International** owners. Up-to-the-minute service is always at your hand. Write to the address below for attractive folders with all the details and full information. You owe it to the prosperity of your future to know more about the **International** Motor Trucks. **Now** is the best time to write.

International Harvester Company of America (INC.)

88 Harvester Building Chicago U S A

THE KREBS COMMERCIAL CAR CO. CLYDE, OHIO U.S.A.

Real Value

You get the full value of your money and more when you invest in a KREBS Truck.

Guaranteed by manufacturers with 16 years' experience in motor vehicle construction, the KREBS combines Simplicity and Low Maintenance with Efficiency and Reliability.

It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault-type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

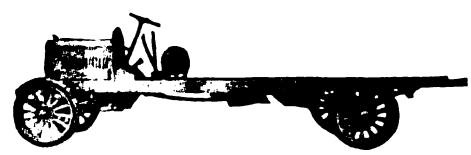
Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.

KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.

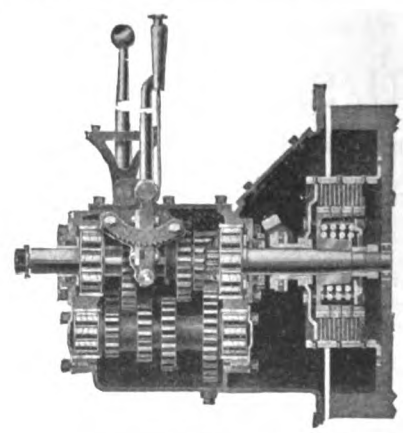
Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.



COVERT COVERT COVERT

TRANSMISSIONS

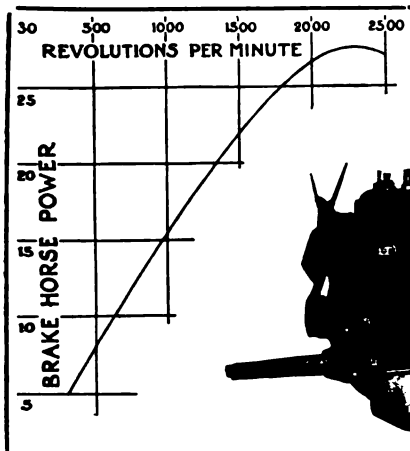


Made in various models for different sizes and types of cars—Covert Transmissions will free you from transmission troubles. Let us show you how they fit your construction.

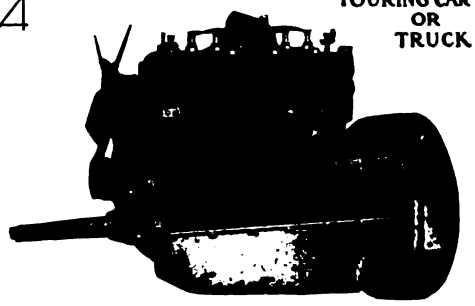
Covert Gear Company, Inc.

Sales Office, Detroit, Mich. **Factory, Lockport, N. Y.**

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LE ROI MOTOR
3⅛×4½ MODEL C
FOR THE LIGHT ROADSTER TOURING CAR OR TRUCK



Used by leading manufacturers of best-known American-made light trucks.

The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

DENBY
TRUCKS
FOR TRAIL OR PAVEMENT

THE buyer of a motor-truck today is faced by a multitude of different makes, whose conflicting claims tend only to confuse him.

Necessarily, in moet cases, he confines his first consideration to the two or three whose satisfactory performance is a matter of common knowledge.

Among these few, the Denby stands particularly high. Its performance has been not merely satisfactory, but exceptional.

The Denby dealer, therefore, is assured of a hearing under the most favorable conditions. The wonderful record of the internal-gear driven Denby is his passport to the buyer's confidence.

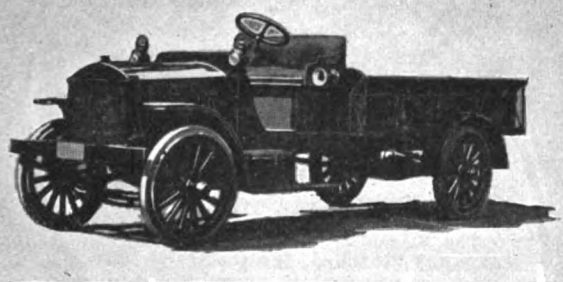
Permanence, based on progress made possible by prestige and performance, is an essential accompaniment of a Denby agency.

Perhaps your territory is available.

Denby Motor Truck Company
Dept. K, Detroit, Michigan



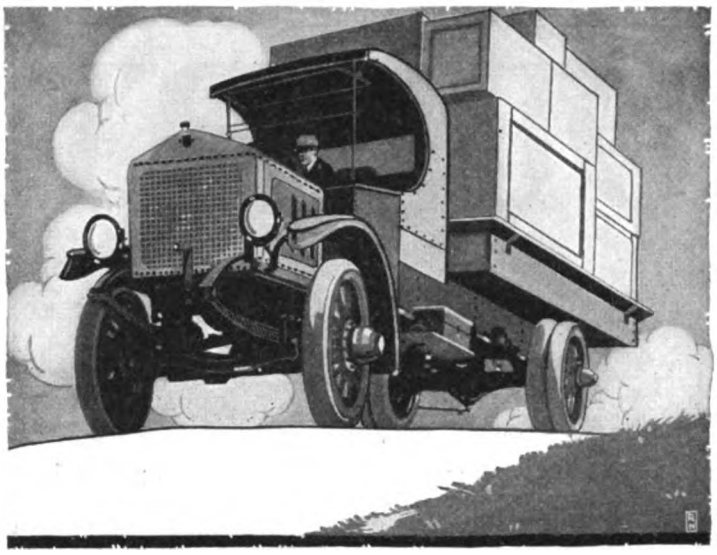
The GLOBE *Truck*
The Motor Truck PLUS



Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

Globe Motor Truck Co.
721 Wright Bldg. St. Louis, Mo.

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Lifting Power That Levels Hills

Power at low speed—power enough and to spare—that's what counts in a heavy truck. When the motor turns slowly, the compression is maximum, the mixture often too dense for an ordinary spark to penetrate.

THE

EISEMANN MAGNETO

is standard equipment on 72 different makes of trucks, largely because the manufacturers' tests have shown that the intensely hot, powerful Eisemann spark penetrates the densest compression even when the motor is barely turning over!

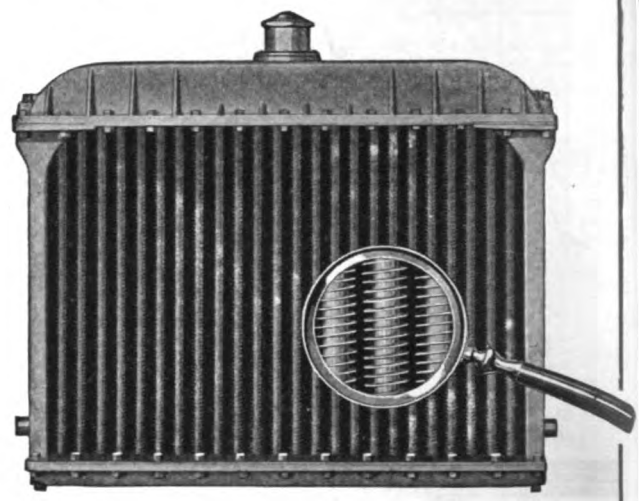
In all, 117 manufacturers have adopted the Eisemann Magneto as standard equipment. They know its dependability, its durability, its power!

THE EISEMANN MAGNETO CO.

Sales and General Offices:
32-33rd St., Brooklyn, N. Y.
Chicago, Ill., 910 So. Michigan Ave.
Detroit, Mich., 802 Woodward Ave.



Seamless Copper Helical Tube Cooling Sections



Are Guaranteed for the Life of the Motor on Which They are Installed

Helical Tube Construction is Accepted as the Best by the Leading Truck Makers of America

Manufactured only by

ROME-TURNEY RADIATOR CO.
ROME, NEW YORK

STEGEMAN SIX CYLINDER TRUCKS

For Heavy Duty Service

The Stegeman has stood the severest strain and stress of heavy duty service. McDonald of Red Rock, Arizona, hauling ore and freight, says: "I have grades averaging 25% and travel 100 miles each day over rough roads and get 5½ miles to each gallon of gas—hauling both ways."

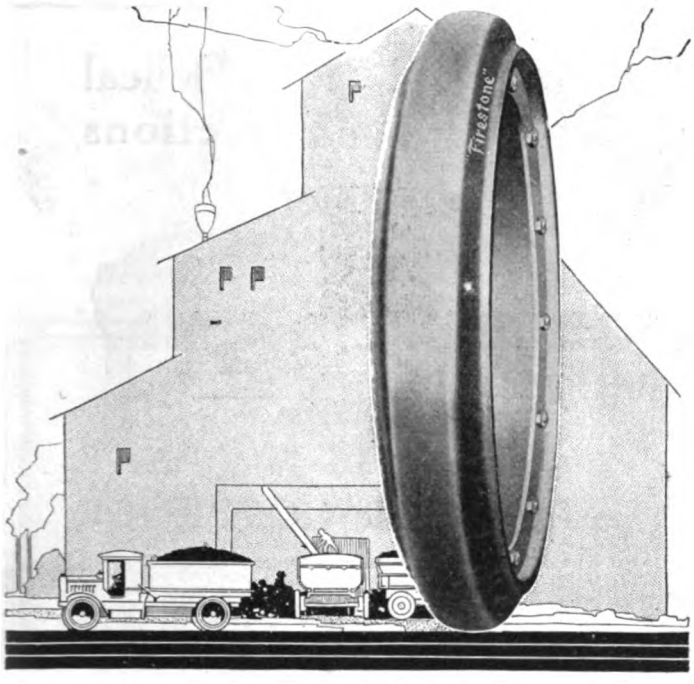
Agents Beat Competition

The Stegeman Six has lots of selling proof and evidence. It's the truck with which you can beat competition, because it possesses features buyers want—and other dealers can't supply. Write for vacant territory.



Stegeman Motor Car Co. Milwaukee

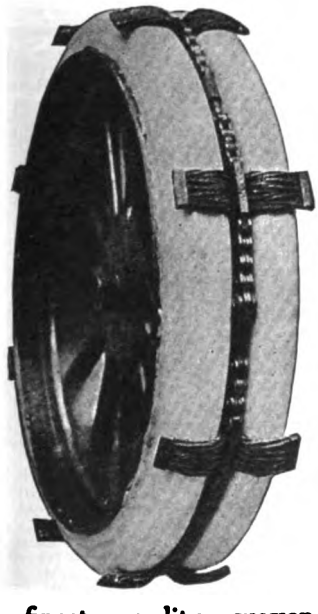
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The right truck tire for every road, load and condition of service. "Most Miles per Dollar." Write for catalog of complete line.

FIRESTONE TIRE AND RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

Firestone Truck Tires



Don't Wait

until the streets are covered with ice and snow, before getting "NEVER - SKIDS" for your motor trucks.

THE NEW TYPE

NEVER-SKID

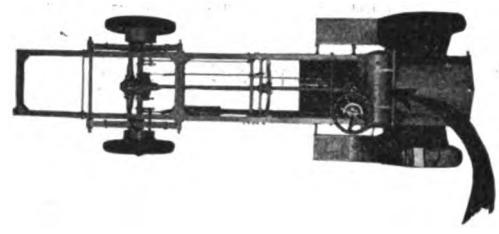
practically eliminates vibration

Does away with skidding and affords positive traction on slippery streets. The cross-pieces are made of the finest quality woven steel wire — **strong** enough for the heaviest machines made.

The device can be applied in a few minutes without jacking up the truck, and there is no danger of its catching in driving chains or damaging tires.

YOU WILL SURELY NEED "NEVER-SKIDS" this winter.
Why not get them now?
Folder and prices will be gladly sent

NEVER-SKID MFG. CO.
122 Liberty Street, New York, N. Y.
New England Distributer: WILLARD B. DAVIS, 20 Danforth Street, Fall River
Chicago Distributer: FRED ALLEN AUTO SUPPLY CO., 1610 S. Michigan Avenue



Burford Trucks

are equipped with the

"JASCO" TANK

Why? Because demonstrated service facts have proven that this gasoline receptacle makes fuel absolutely safe from fire or explosion and devotes every drop to energy.



"JASCO" TANKS are made of drawn steel. They are seamless, tinned and tested and positively cannot spring a leak even under the most severe conditions. They are money savers, life and property protectors. If your car is equipped with an old fashioned riveted tank you are courting danger. Investigate the "JASCO" today. Full details on request.

The "Jasco" Tank is used and indorsed by the following prominent manufacturers:

PLEASURE CARS

Biddle Motor Car Company, Simplex Automobile Company, Mercer Automobile Company, Lozier Motor Company, Stanley Motor Carriage Company, James Cunningham Son & Company, H. H. Franklin Mfg. Company.

TRUCKS

Baldwin Locomotive Works, Autocar Company, General Vehicle Company, H. G. Burford Company, Peerless Motor Car Company, Garford Motor Truck Company, Gramm Motor Truck Company, Thomas Auto Truck Company, Motor Trucks, Ltd., Canada.

JANNEY, STEINMETZ & CO.
Main Office: PHILADELPHIA
New York Office: HUDSON TERMINAL BUILDING

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The talk has turned to equipment



"Now, gentlemen," said the General Manager of a large motor car factory, "the success of our car has been built up by sincerely studying where improvements could be made in efficiency, durability and quality refinements."

"What about bearing equipment on our new models?"

"I am convinced that this matter of bearings is vitally important," replied the Sales Manager. "From the standpoint of the purchaser of the car, and as a selling proposition, ball bearing equipment—a full jeweled job, giving every rotating part in the chassis the frictionless movement of a full-jeweled watch—has a decided selling advantage. I submit that we equip throughout with ball bearings."

"I second that recommendation," said the Advertising Manager, "for ball bearings throughout will be an added and convincing publicity feature in the sale of our car."

"What do you say, Mr. Engineer?" inquired the General Manager.

"It certainly follows the best engineering practice," replied the engineer. "Ball bearings reduce frictional resistance and wear to the vanishing point, give longer life to every part of the machine, successfully resist shocks, thrusts, stresses, from any and all directions. In my opinion, ball bearings in our car mean chassis perfection."

And the Master Mechanic added: "Yes, and ball bearings are a complete, self-contained unit that never require adjustment, are absolutely trouble proof, and offer the advantage of comparatively inexpensive installation, assembly and upkeep."

This conversation is interesting to every dealer and car owner, for

NEW DEPARTURE BALL BEARINGS

mean not only mechanical perfection, but highest efficiency in service and lowest operating and upkeep cost.

Send for the interesting booklet "New Departure Ball Bearings and what they mean to the Car Owner."

THE NEW DEPARTURE MFG. CO.
BRISTOL, CONN. 818-20 Ford Bldg., DETROIT

MONARCH
LIMITS THE SPEED AND THE EXPENSE



A Dependable GOVERNOR

The Monarch is the only Governor designed solely for internal combustion engines.

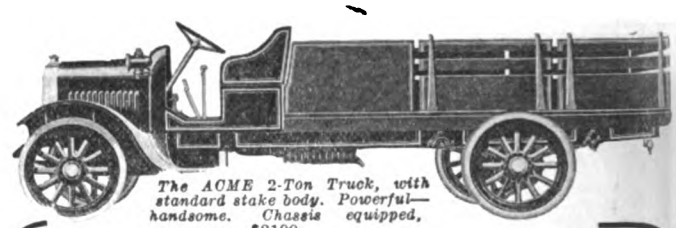
It checks excessive speeding—prevents the greatest of all truck abuses.

It limits the speed without limiting the power. Both automatic and manual control is through the Monarch Governor throttle—the carburetor throttle being removed. Throttle can't be wedged open.

The owner holds the padlock key and no readjustment can be made without his knowledge.

Write us today about a 30-day trial on your truck.

Monarch Governor Company
520 Bethune Avenue West, Detroit, Mich.



The ACME 2-Ton Truck, with standard stake body. Powerful—handsome. Chassis equipped, $2100.

Fill Immediate ACME Orders!

DEALERS: Get the quick, profitable business of local truck buyers who know the advantages of ACME Trucks and want them for early delivery. The surest selling features to meet customers' requirements for from 1-ton to 3-ton capacities.

Clinch the ACME Agency now—and sell easily, with substantial profit. No large service to render because of fifteen famous "Proved Units" from radiator to tail light. ACMES have oversize dimensions. The 2-ton ACME has powerful 40 H. P. Continental Motor and big capacity—Chassis, equipped $2100.

ACME THE TRUCK OF PROVED UNITS

Be in a position to accept big business on our One-Ton Truck. Announcement and specifications sent on request. An all-feature worm drive ACME —$1500.

Write for Booklet, "A Business Builder," and Territorial offer today. Or WIRE—

Cadillac Auto Truck Co.
14 Mitchell Street
CADILLAC, MICHIGAN

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"We want your O. K. on our brakes before we go"

Educating Motorists to ask dealers' advice on brake lining

We aim to increase your brake lining business by educating car-owners to say this every time they leave a garage. We are showing them why they should reline their brakes with efficient brake lining if there is any slip or grab.

We are teaching them to insist on 100% efficient brakes. In our advertisements now running in the Saturday Evening Post, Collier's Weekly, Literary Digest, Christian Herald, Country Gentleman, Life, and motor publications, with nearly 4,000,000 readers—we are teaching motorists to *be sure of their brake lining* and to specify Thermoid Brake Lining. This means an increased demand for Thermoid Brake Lining which *you* will feel.

Lining by listing in our advertisements the twenty-two leading cars and ten leading axles which use Thermoid Brake Lining. Motorists are sure to specify the brake lining that *experts* specify. Many motorists are going to come to you and specify Thermoid. Be ready for the demand.

We will send you free illustrated price lists and a store sign that will tell your customers you handle Thermoid Brake Lining.

Thermoid Rubber Co.
Factory and Main Offices:
TRENTON, N. J.

BRANCHES: New York, Chicago, San Francisco, Indianapolis, Detroit, Los Angeles, Philadelphia, Pittsburgh, Boston, London, Berlin, Paris.

Our Guarantee:
Thermoid will make good or WE WILL

Proving Thermoid Brake Lining's Quality

We are proving the quality of Thermoid Brake

Thermoid
BRAKE LINING
WON'T GRAB OR SLIP

Standard

MADE IN DETROIT USA

Motor Trucks

Startled the Motor Truck Industry By a Unique Sales Plan

First of all, the Standard is an unusual truck. It is a powerful combination of many of the best-known units manufactured—parts that are considered the standard the world over.

The Standard Motor Truck is sold in an unusual way. Costs you nothing to learn of the Standard Selling Plan. It is the most liberal ever made.

Write for details of this plan. No obligation.

Standard Motor Truck Co. 315-327 Bellevue Ave. Detroit, Mich.



THE MARK OF A BETTER RADIATOR

G & O Radiators for Heavy Duty Service

The G & O Mfg. Co.
New Haven Connecticut

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POLACK TYRES

WAWA DAIRY FARMS

WAWA, DELAWARE COUNTY, PA. March 12, 1917.

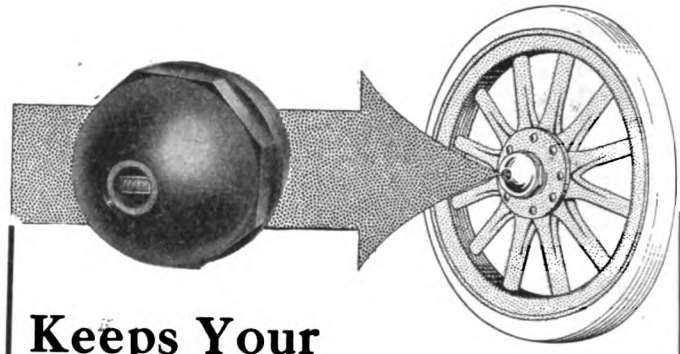
Polack Tyre and Rubber Co.,
1906 Market St., Phila., Pa.

Gentlemen:-

According to our records the left front tire removed from our 6½ ton Saurer truck March 10th ran 17,840 miles.

Yours very truly,
WAWA DAIRY FARMS.
Per T

10,000 Miles Guarantee Invariably Exceeded



Keeps Your Mileage Records Accurate

You can eliminate waste mileage and stop your delivery leaks. You can know what your trucks are doing by using the—

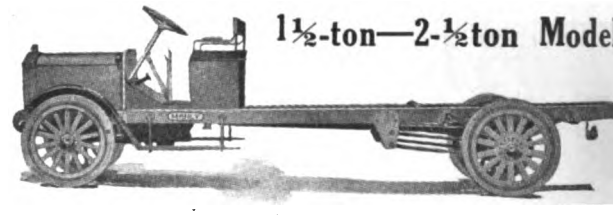
DREADNAUGHT
Indestructible
Hub Odometer

If you have one truck or one hundred you need a mileage record—it lowers operating and maintenance expense and puts it up to the driver to save you money.

The Dreadnaught is guaranteed indestructible. We'll give you a new one if you break it. And it is easy to read—the figures are always right side up.

Write for booklet and prices

AMERICAN TAXIMETER COMPANY
Manufacturers of Jones and Poff Taximeters
1765 BROADWAY NEW YORK CITY



America's New Quality Truck Has 20 Remarkable Features—

features proven in the fire-test of actual service to be of money-saving merit to users and sales creative value to dealers. These set MANLY Trucks in a class far up among quality commercial vehicles.

MANLY TRUCKS

Wire or write for advance information or visit our factory. Handsomely illustrated catalog sent on postal request.

Territorial arrangements now being made for early deliveries

MANLY MOTOR CORPORATION
WAUKEGAN ILLINOIS
1432 Michigan Avenue Chicago, Illinois

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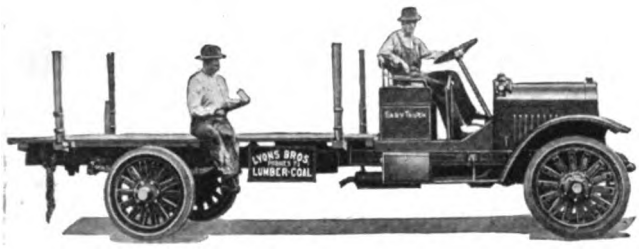
The

Gary Motor Truck Company

Manufacturers of

Gary Worm Drive

MOTOR TRUCKS



5 MODELS ***5 CAPACITIES***

¾ Ton 1 Ton 1½ Ton 2 Ton 3 to 3½ Ton

Complete 1917 Catalog will be mailed Promptly on Request

General Offices:

GARY MOTOR TRUCK COMPANY

610 BROADWAY GARY, INDIANA

"EVANS"



UNIVERSAL JOINTS

Pat. Pending

The easy, smooth operation of "Evans" Universal Joints assures a minimum amount of lost power and a lasting period of serviceability.
Constructed of two hardened trunnion blocks of large area running in spherical slots and also acting as a bushing for the right angle hinge motion. All working parts encased within a dust-proof housing which also holds grease to lubricate the working parts.

Write us for further particulars.

"Hele-Shaw" Clutches
"M. & E." Grease Cups

MERCHANT & EVANS CO.
Philadelphia

New York
Baltimore
Atlanta
Cleveland

M&E

Wheeling
Chicago
St. Louis
Kansas City

NEVER-LEAK
Copper Asbestos-Filled
GASKETS

Get your estimate on your next gasket requirements. You will be agreeably surprised.

For producing absolutely gas-tight joints nothing has ever been invented to compare with Never-Leak Gaskets. You can protect yourself from all worries over compression leaks if you fully equip your motor with these Copper Asbestos-Filled Gaskets.

The copper gives malleable metal contact surfaces. The asbestos secures a body which retains a powerful spring under compression.

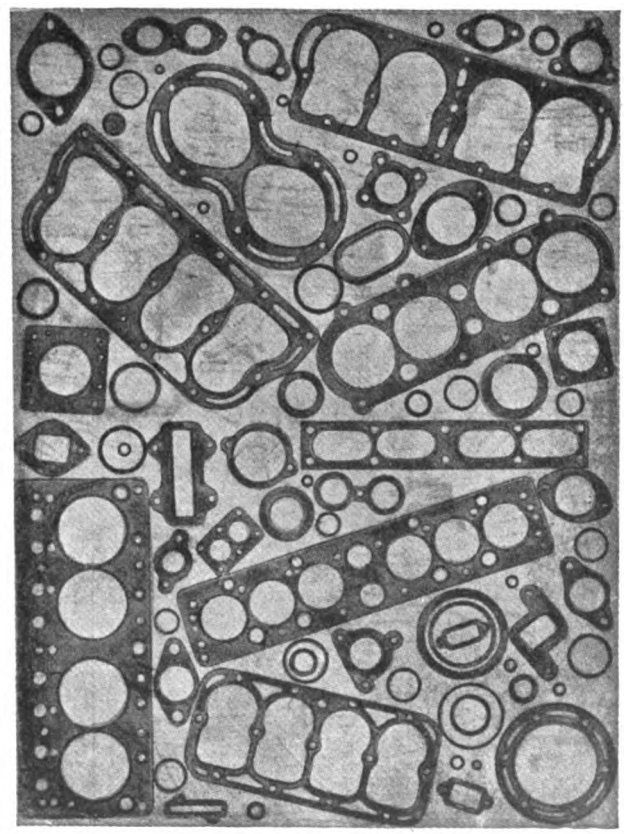
If you have gasket trouble of any nature consult our Engineering Force. This will involve you in no obligation or expense.

Write for our estimates. We are equipped with many thousand special dies such as here shown and can readily produce the gaskets you need.

Have "Never-Leak" on every gasket.

The Fitzgerald Mfg. Co.
TORRINGTON, CONN.

Gasket Dept.



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LAMSON TRUCKS

5 POPULAR SIZES

Ready for Prompt Deliveries



LAMSON 2½-Ton Truck

SPECIFICATIONS

Motor—Wisconsin, 4 cylinder, long stroke.
Springs—Semi-elliptic. Steering Gear—Ross.
Axles—Sheldon. Tires—Optional.
Clutch—Borg & Beck. Transmission—Cotta.
Carbureter—Stromberg.
Gas Supply—Seamless steel tank with Stewart Vacuum System.
Ignition—Dual—Bosch Magneto and Atwater Kent Unisparker.
Governor—Duplex. Electric Lights—Vesta System.

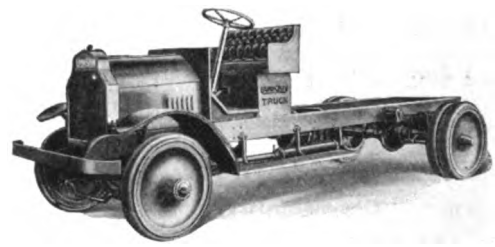
Correspondence Solicited with Live Dealers and Distributers

Lamson Truck & Tractor Co.
4644 W. Madison Street, Chicago

LAMSON Trucks are actually manufactured in all sizes advertised, and in sufficient quantities to meet with prompt and satisfactory delivery all orders from dealers, fleet owners or individual users.

Every business requirement from light delivery to heavy hauling is covered by a LAMSON model. The field for sales is unlimited.

1-Ton—1½-Ton—2½-Ton—3½-Ton—5-Ton Capacities



Chassis of a LAMSON 5-Ton Truck

Garford

MOTOR TRUCKS

Garford Trucks range from one ton to six tons in capacity.

They are designed and built by men who have spent their lives in the study of motor trucks.

They are backed by one of the strongest organizations in the industry.

Bodies are provided to meet all requirements.

Write for catalog. Please address Dept. 103

The Garford Motor Truck Co., Lima, O.



Thinking About Trucks?

If you are, you're thinking about motors—wondering which one will stand up best under the tests your work will put it to. Men who know motors will tell you there's dependable quality in Wisconsin Consistent Motors that keeps them on the job, working at full efficiency.

Motors for pleasure cars, trucks and tractors. Write for specifications.

Wisconsin Motor Mfg. Co.
Sta. A-Dept. 319 Milwaukee, Wis.

New York Branch: 21 Park Row, T. M. Fenner, Factory Representative.
Pacific Coast Distributors: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles Co., Los Angeles, Cal.

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Two Reo Trucks
One Reo Quality

THAT SAME QUALITY that has made Reos known the world over as "the Gold Standard of Values."

THE SAME ENGINEERING — same "50 per cent oversize" in all vital parts—same care in making.

IS IT ANY WONDER that the best dealers are most desirous of handling the Reo line?

A REAL GUARANTEE back of your promise to the buyer.

THOSE ARE the factors that make it pleasurable as well as profitable to sell Reos.

Reo Motor Car Company
Lansing, Mich.

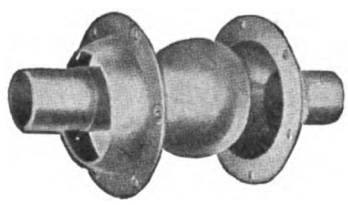


prices are f. o. b. Lansing, Michigan, subject to increase without notice

"THE GOLD STANDARD OF VALUES"

BOSSERT

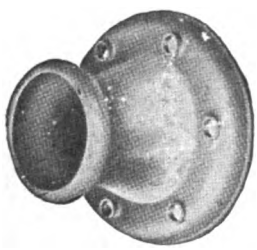
In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice.



We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



The Bossert Co.
UTICA
N. Y.

Heavy Duty Truck Frames

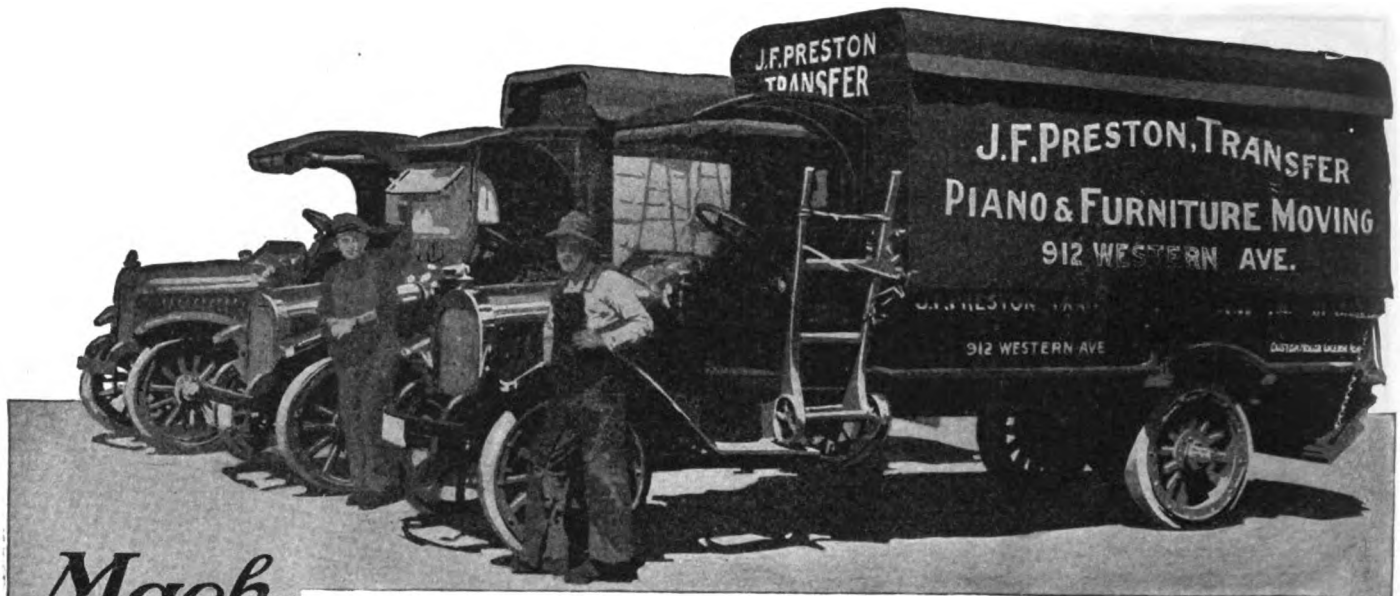
Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

Added capacities together with latest type equipment enables our assuring you of satisfactory service.

Our engineers are at your service, and we solicit your inquiries.

DRIGGS-SEABURY ORDNANCE COMPANY
SHARON, PENNA.

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Mack
TRUCKS

LIGHTER in weight than the ordinary truck, but their endurance and power are unequalled. Built for efficiency in service. Capacities from 1 to 7½ tons.

"Performance Counts"

INTERNATIONAL MOTOR COMPANY, NEW YORK
64TH STREET AND WEST END AVENUE

DIAMOND T
TRUCKS

Diamond T Service is as thoroughly built into our ¾-ton trucks, the smallest of the line, as it is in our 3½ ton model.

Its low cost is made possible only by its wide popularity which has enabled us to produce this model in enormous quantities. There has been no cheapening of quality or inferior workmanship permitted in its design or construction.

For a thousand uses it is the most satisfactory and economical delivery vehicle ever marketed. With a body suited to your requirements, it will improve your delivery service while lessening your operation expense.

Write to-day for catalog.

Diamond T Motor Car Co., Chicago, Ill.



NORTH AMERICAN MOTORS

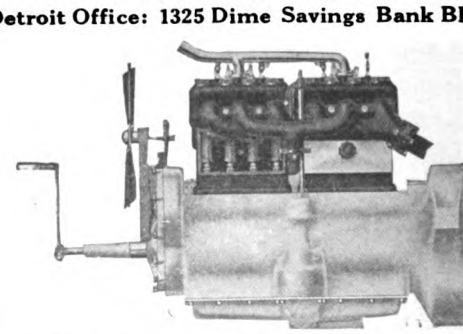
This is to announce two new models which have been added to the "N. A." line. They are: Model C, developing 20-25 H.P., and Model CX, developing 25-30 H.P.

These motors round out a line of power plants for commercial vehicles which are the most thoroughly accessible and simplest truck motors ever designed.

Full information on these new models or on our entire line will be gladly sent.

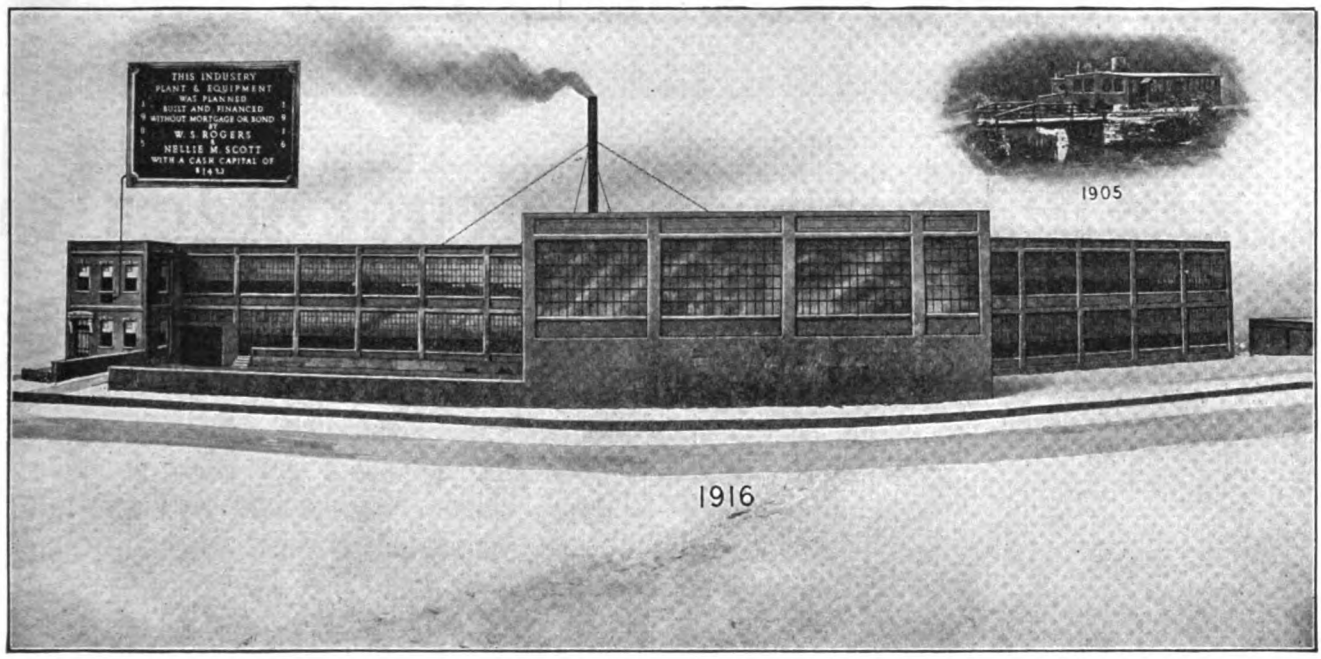
A Detroit office has been opened at 1325 Dime Savings Bank Building.

NORTH AMERICAN MOTORS COMPANY
Factory: POTTSTOWN, PA.
Detroit Office: 1325 Dime Savings Bank Bldg.



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A STUDY IN EFFICIENCY



FAITHFUL SERVICE TO CUSTOMERS DID IT

THE BANTAM BALL BEARING CO., BANTAM, CONN.

INDIAN

—a tire that backs the Guarantee

Much is heard now-a-days about guaranteed mileage in motor truck tires. In their anxiety to succeed some manufacturers have gone to extravagant mileage claims for their tires. And the results have been disastrous.

Not so with Indian Tires. The men behind the Indian realize that a mileage guarantee is only as good as the tire behind it and have made that policy a stepping stone to success.

Indian Tires, though only recently introduced have deeply impressed those who have watched them perform in every phase of motor truck service. They are guaranteed to give as much mileage as any tire made, and more often than not they give more. It is the quality of the material put into them that does it.

INDIAN TIRE & RUBBER COMPANY

New Brunswick **New Jersey**

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Announcement of

To Motor Truck Dealers

Those Now Selling Motor Trucks

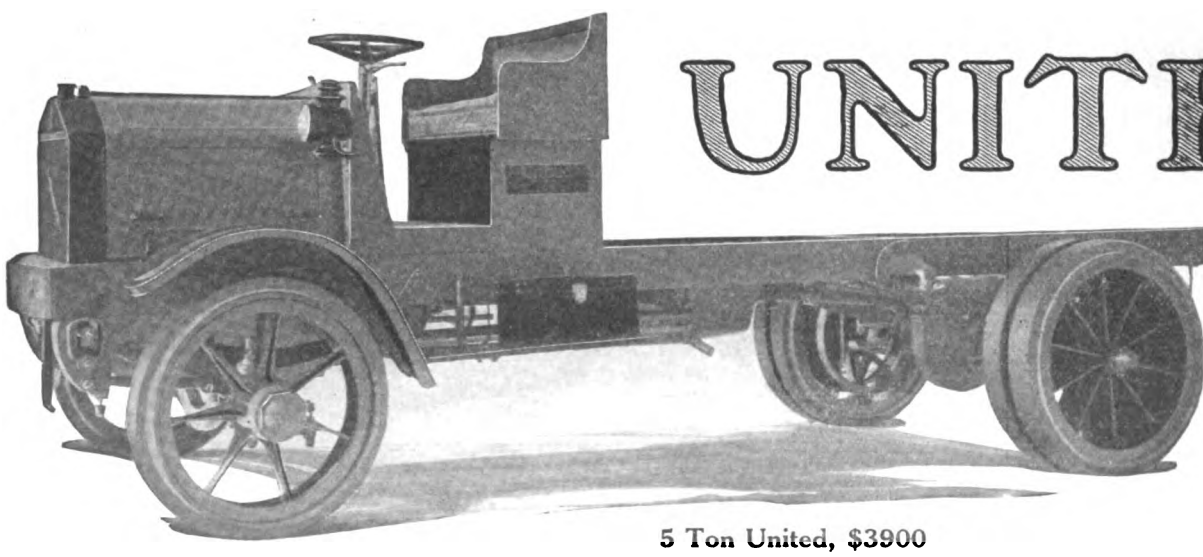
You, perhaps, have been waiting for just this opportunity to secure the selling rights of a representative line of motor trucks—a line already a success and back of which there is an established and progressive organization. This, then, is your opportunity.

Beginning this month the output of UNITED trucks is being practically doubled, enabling us to supply territory which we have hitherto been forced to neglect. Your opportunity to secure an exceedingly valuable sales franchise is obvious.

The UNITED line includes 2, 3½, 4 and 5 ton models —all of which are of the popular worm-drive type. UNITED trucks are built to stand up and give continuous service in spite of the overloads which are so often imposed.

A study of the specifications will convince you that its independence of competition and ready salability have created a rare business opportunity for a number of live, money-making dealers.

UNITED



2, 3½, 4 and 5 Ton Models, All of the Popular Worm-Drive Type

5 Ton United, $3900

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an Opportunity

To Prospective Motor Truck Dealers

Those Who Expect to Sell Motor Trucks

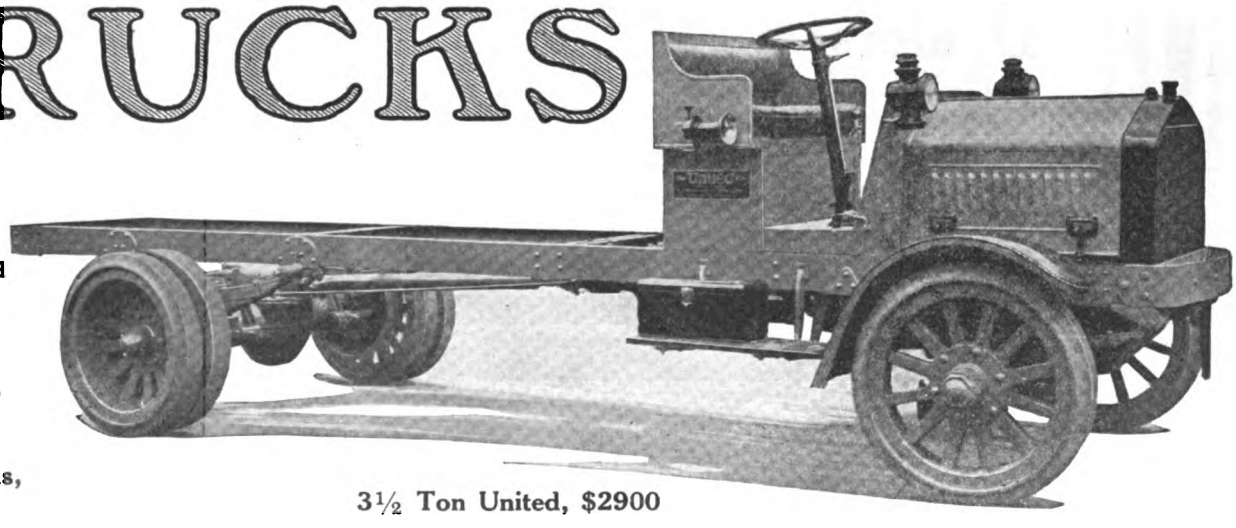
To you who contemplate entering the Motor Truck Selling Field on a substantial basis this announcement is most opportune. It affords you the certainty of starting out with everything in your favor.

It offers you an established line, the salability of which is proven by this increase of our output—it offers a connection with a manufacturing organization which is thoroughly established, experienced and able to assist you materially.

Also we can help our dealers arrange to finance purchasers of UNITED trucks by the time-payment plan. You can readily appreciate the great advantage of this sales help—it makes sales that otherwise could not be made.

Whether you are selling motor trucks today or considering entering this field, it will be to your advantage to get complete information relative to the UNITED line and our new sales proposition. **Real** opportunities do not last long—better wire us **now** for our proposition and an option on your territory.

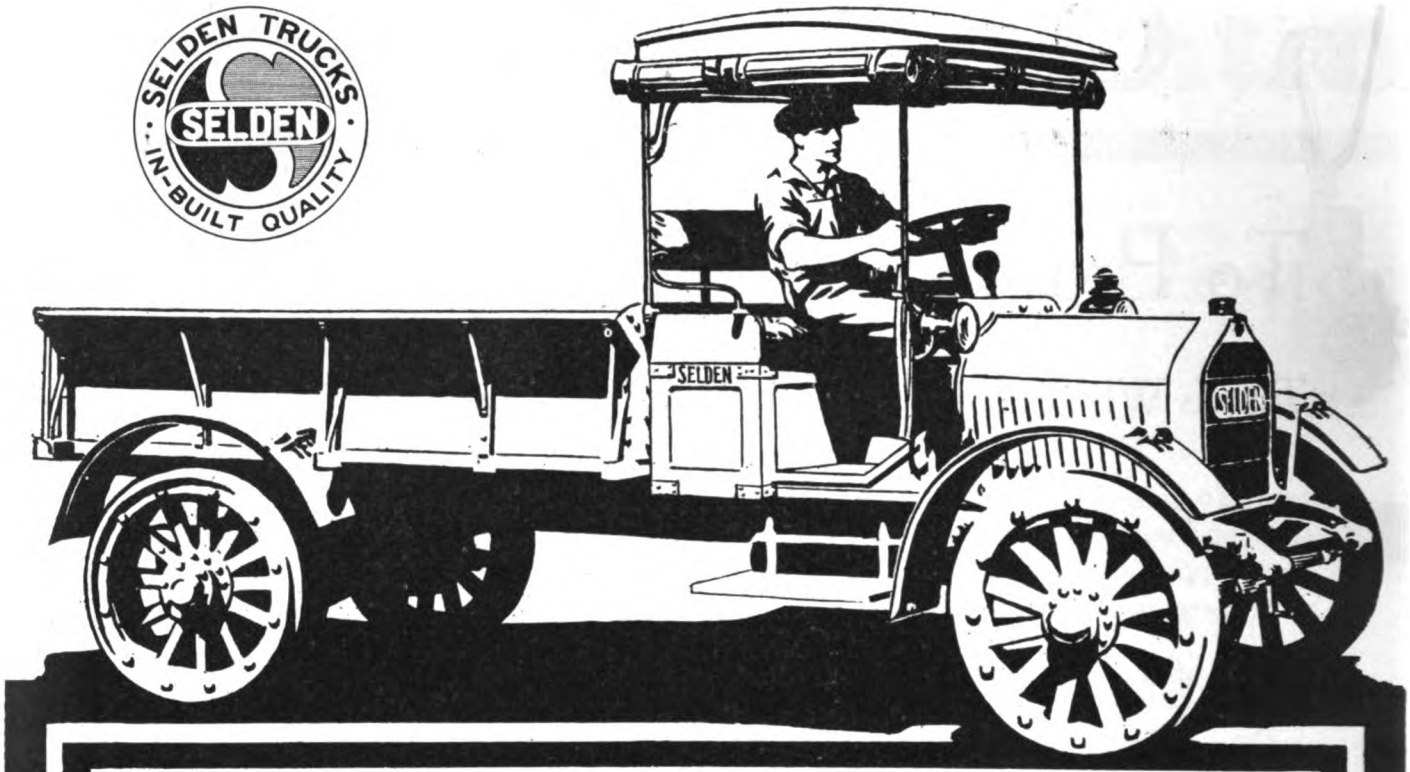
TRUCKS



3½ Ton United, $2900

Manufactured by the
United Motors Co.
Grand Rapids, Mich.

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Compare Selden "IN-BUILT QUALITY" Trucks part for part with other "quality" trucks of the same rated capacity and you will find in

Selden Trucks

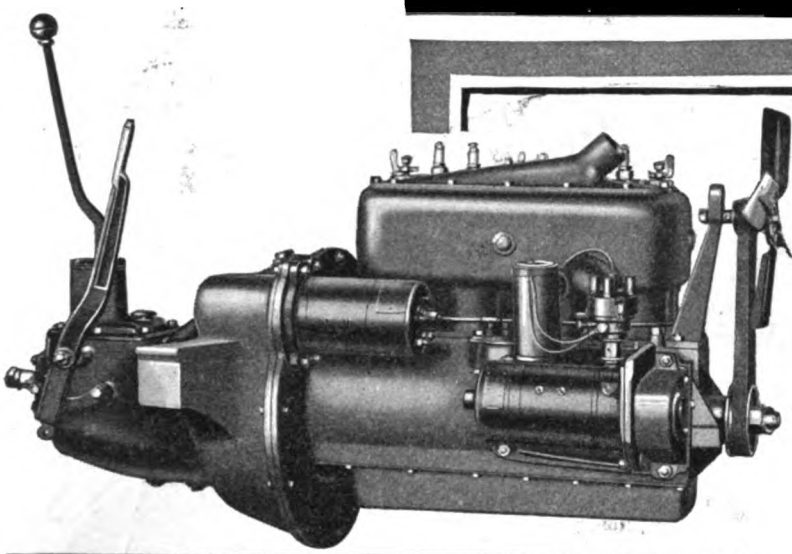
bigger, better construction—greater strength—greater hauling power—greater speed—greater ability to render long, profitable service.

¾ Ton, 1 Ton, 2 Ton, 3½ Ton, 5 Ton

Dealers: The new Selden Sales Proposition is different and more liberal than any you have ever had offered to you before. Write for it—be quick—it will soon be too late.

Selden Truck Sales Company, Rochester, N. Y. U. S. A.

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Four Cylinders, 3¾ x 4½ (22½ H. P. A. L. A. M.) 36.9 H. P. at 2800 r. p. m. Three bearings. All G. B. & S. Motors now provide for two-unit starting and lighting system only—operating through Bendix Drive.

Concentration —a bond to Quality

THE minute an engineer takes the time to investigate a G. B. & S. Motor, and give it a real test under trying conditions, that instant we begin to make a convert to the G. B. & S. **idea.**

And by the same token, the buyer who drives a "G. B. & S." Motor instantly appreciates the various distinctive advantages that result from concentration on one model.

He finds that though this motor is rated at 22½ H.P., it develops 36.9 horse-power.

Thus he has a flexibility of operation and range of speed at his command unique in four-cylinder motors.

He is impressed by the rugged design and the marked simplicity. He is pleased with the economy. He likes the accessibility of every part. He likes the easy method of adjusting the chains, insuring silence.

And he is delighted with the snap, verve and **powerfulness** of what he enthusiastically acknowledges is one of the best four-cylinder motors ever built.

By concentrating all our energies on this one type of motor, we virtually bind ourselves to produce a superior article—there is no other alternative. We accept the situation as it is and we leave it to "G. B. & S." users (increasing every season) to say whether or not we are delivering the goods.

For blue-prints and other information, write

Golden, Belknap & Swartz Company

Detroit, Michigan

G·B&S motors

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HESS-BRIGHT'S CONRAD PATENTS ARE THOROUGHLY ADJUDICATED



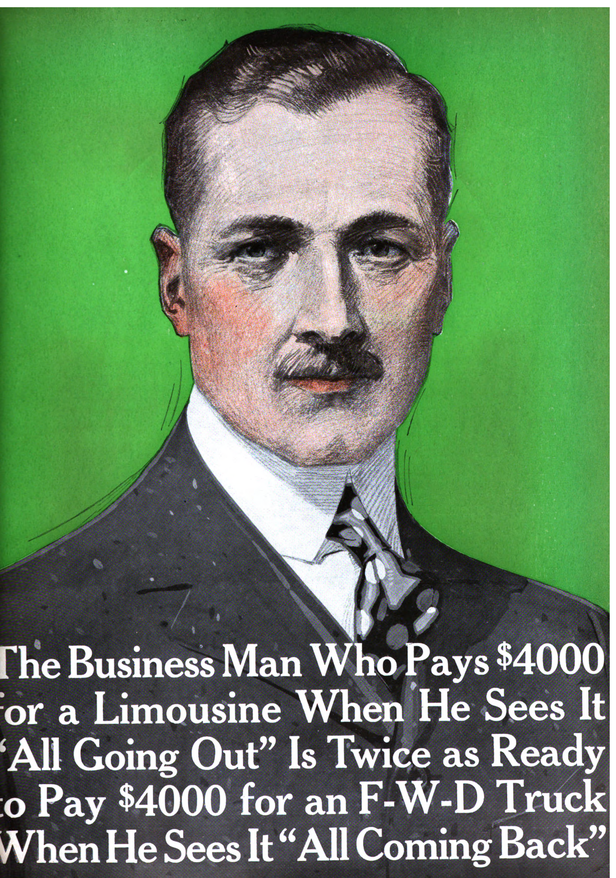
HESS-BRIGHT BALL BEARINGS

Inspire confidence wherever known. *They bear the load efficiently.* The quality of HESS-BRIGHT BALL BEARINGS represents the built-in-intention of the world's best bearing makers.

THE HESS-BRIGHT MANUFACTURING COMPANY
PHILADELPHIA, PA.

Hess-Bright Distributors for Retail Trade in Every City of Importance

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Driving Power in All Four Wheels

Look at this construction. This is the simple and direct manner in which the four wheel drive principle is transmitted from the power plant to the road wheels in F. W. D. trucks.

Instead of *all* the power being shot clear back to the rear axle, leaving the front end a dead and idle load, the power is *divided*, sending half to the front and half to the rear axle, making every wheel a power wheel.

This is why F. W. D. trucks will out-demonstrate anything on four wheels, not only in daily average service but in super-service, in sand, mud, broken stone, on hills and over otherwise impassable going where other trucks will not perform.

Multiple Disc Clutch through which power is conveyed from the engine to the transmission.

Forward Differential and propeller shaft. Power is conveyed to the front live axle precisely in the same manner as to the rear axle.

Rear Differential and propeller shaft through which half the engine power is transmitted to the rear road wheels.

The exclusive F.W.D. *Center Differential* through which the power is divided and sent to front and rear axles. Its equalizing action between the two axles is precisely the same as that of the front and rear differential between two wheels.

F W D

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Tire manufacturers give to users of F. W. D. trucks with four six-inch tires, the same guarantee which they give on rear-drive trucks with six six-inch or dual rear tires.

Economy

Every truck user knows, and every dealer knows that the big, definite expense that constantly looms up in truck operation, is tire cost.

F. W. D. trucks cut tire cost from the start, not only by putting equal strain and wear on each tire, and cutting out the backlash resulting from resistance of idle wheels, but also from the fact that only four six-inch tires are used instead of six. Read the statement of the tire manufacturers' guarantee on this page.

But tire economy is not all. With every wheel a driving wheel, more power is delivered to the road wheels and utilized—a higher percentage of power per gallon of gasoline actually transmitted into service rendered.

And in addition, the equal distribution of pull, the distribution of load—45% front, 55% rear—means equalized strain, equalized wear—no abnormal strain or wear on any one part of the mechanism. As a consequence F. W. D. trucks stay on the road in active daily service, with practically no outlay for repairs.

FWD

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Specifications

Model B—Three Ton Chassis

Load Capacity—3 Ton.
Chassis Weight in Pounds—6,200 pounds.
Wheel Base—124 inches.
Tread—56 inches.
Turning Radius—24 feet, 6 inches.
Speed—14 **miles** per hour.
Tires—Make, optional. Front and rear, 36x6.
Wheels—Front and rear interchangeable, 36x6 S. A. E. Standard. Artillery type.
Number of Cylinders—Four. Bore, 4¼. Stroke, 5½. Offset of Cylinders, ¾-inch.
Diameter of Crank Shaft on all Bearings—2 inches.
Front and Center Crank Shaft Bearings—3½ inches long.
Connecting Rod Bearing—3½ inches.
Diameter of Wrist Pins—1⅞ inches.
Diameter of Cam Shafts—1½-inch.
Length of Connecting Rod—12 inches.
Drop of Motor from Supporting Arms to Center of Crank Shaft—3 inches.
Length of Pistons—6 inches.
Engine Governor—On manifold, regulated and set at 1,100 revolutions.
Number of Piston Rings—3.
Control—Hand throttle and lever.
Diameter of all Valves, Intake and Exhaust—2⅛ inches.
Weight of Motor—580 pounds. Horse Power—A. L. A. M. rating 36.1.
Cooling System—Centrifugal pump and radiator fan driven from pump shaft.
Radiator—Perfex Type. Three point suspension.
Radiator Capacity—8 Gallons.
Ignition—High tension magneto.
Carburetor—Stromberg.
Motor Lubrication—Force feed to all bearings and combined splash system.
Gear Set—Shifting quadrant—own make. Location—on seat frame.
Number of Speeds—Three speeds forward and one reverse.
Transmission—Jaw clutch type—selective, gears always in mesh.
Gear Ratio of the Transmission—1:1 on high, 2:1 on second, 4:1 on low and 4.13:1 on reverse.
Gears—1¼ inch wide, 5 to 7 pitch.
Total Gear Reduction—8.9:1 on high, 17.80:1 second, 35.60:1 low, 36.07:1 reverse.
Sub-Transmission—Driven by silent chain on differential, which has a locking device.
Springs—Alloy Steel. Front springs 2½ inches wide, 45½ inches long, semi-elliptic, platform spring in the rear. Side springs, 2⅜ inches wide and 44 inches long. Cross springs, 2⅛ inches wide, 40½ inches long, semi-elliptic.
Shifting Levers—Steering wheel irreversible. Gear shift location—on seat frame. Emergency brake location—on seat frame.
Clutch and Foot Brake Pedal—Hele-Shaw Multiple Disc Clutch, consisting of steel and copper plates running in oil.
Gasoline Capacity—20 Gallons.
Universal Joints—Full double universal joint between clutch and transmission and one universal joint on each end of driving shafts.
Axles—Both axles full floating—front axle having patented ball and socket containing universal running constantly in oil.
Brakes—External service foot brake on transmission shaft 10 inches diameter by 3¼ inches wide. Eternal emergency brake 15½ inches diameter by 2¾ inches wide.
Bearings—All hub bearings interchangeable for all four wheels. Two bearings used to each wheel.
Equipment—Complete set of tools. Tool-box, oil cans, horn, Hub-cap, motor and magneto wrenches. Two kerosene side lamps, one kerosene tail lamp.
Painting—Chassis painted in lead color.

Dealers There is at present some extremely profitable open territory, offering a remarkable opportunity to build up a big, sound and permanent business on F. W. D. trucks. Write us for full information on discounts, terms and the details of our contract. Or, better still, come to Clintonville and talk it over.

FWD

Four Wheel Drive Auto Company
Clintonville, Wisconsin

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BACK YOUR BUSINESS with OUR MONEY and METHODS and Watch It GROW



THE coupon below brings you particulars about a plan that will double and triple your motor car sales and make every one of them far easier to close.

You can hook up your business to it at once without a cent of investment on your part. It is the biggest thing ever offered to the automobile dealer.

Don't lose a single moment in getting full information. Your big selling season is on. Clip the coupon and send it back to us at once—this minute.

Better still, wire us for details, phone, or take the first train to Chicago and talk it over with us personally.

C.V.
1.

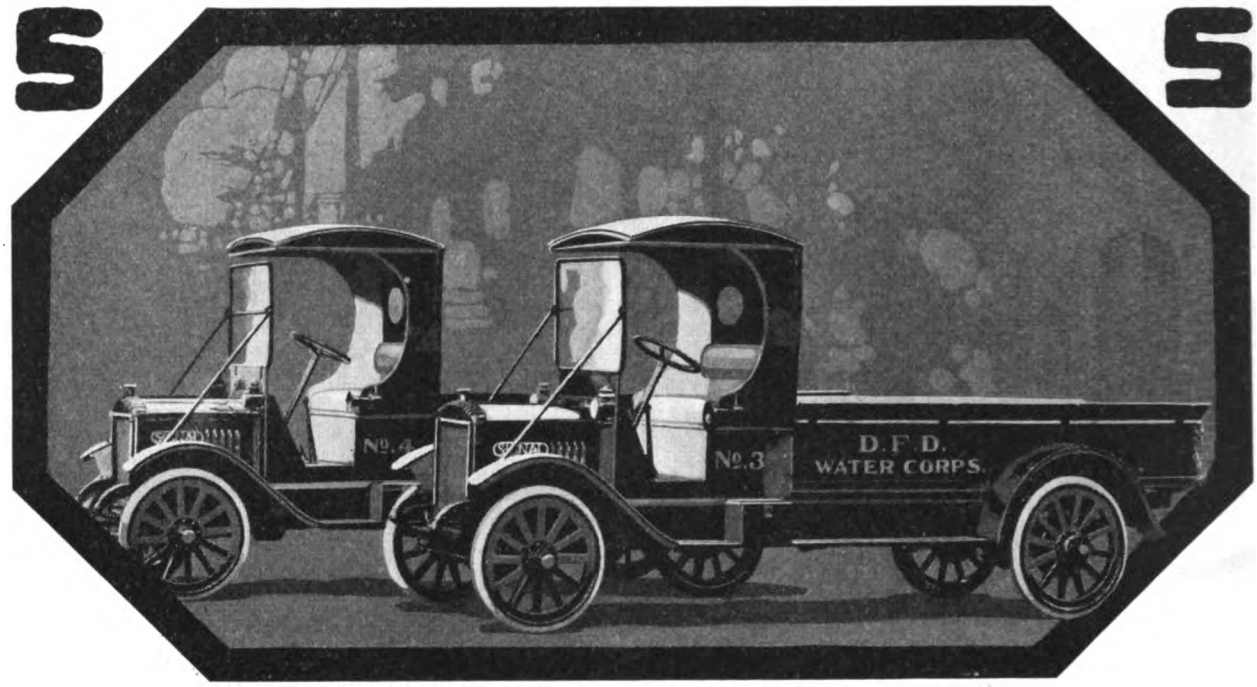
National Bond and Investment Co.
First National Bank Bldg., Chicago

If you can increase my business, I want to know how. Send me full particulars without any obligation to me.

Name .....
.....
Address .....
City .....
State .....
I am agent for.....*cars*

NATIONAL BOND & INVESTMENT COMPANY
Melville N. Rothschild (Not Inc.) *John L. Little*
FIRST NATIONAL BANK BUILDING CHICAGO, ILLINOIS

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TWO SIGNAL TRUCKS "ON THE JOB" FOR DETROIT FIRE DEPT.

"On the Job"—Always

It's the persistency in doing a good thing that counts.

A truck that is on the job one day and not fit for work the next day is a liability. It had better be dispensed with.

You sum up all the desirable virtues of a truck when you utter these four words, "It's on the job."

There is no better quality for the truck *owner,* for it means that his truck is paying its way, not eating its head off.

There is no better quality for the man who wants the load, for it means he will get the merchandise on time.

There can be no better quality from the standpoint of the truck *salesman* and truck *dealer,* for it means freedom from persistent, embarrassing and costly service calls.

The phrase "On the Job" was fixed to the Signal by the owners of Signal trucks, who, when asked about them, uniformly replied that they were "On the Job."

Such desirable quality is a direct result of high grade construction, specifically designed to accomplish the result expressed. There are no better units than Continental Motors, Timken-Detroit Axles, Brown-Lipe transmissions, etc. If there were Signal would use them.

SIGNAL MOTOR TRUCK COMPANY

DETROIT, MICH.

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Announcing

"The Baby Wood"

HYDRAULIC HOIST

(TYPE "E")

—the lightest,
—the simplest,
—the most positive,
—the quickest-working

And the **most easily installed** dumping device made;

—the inevitable choice—therefore—of the 1917 buyer of light dumping equipment.

Expressly designed for trucks of 2-ton capacity; but equally adaptable to one and 3-tonners.

Supplied with new special model rear-dump body, forming an ideal combination for every manner of light hauling and dumping.

Weight approximately 250 lb.; requires a space of only 13½ inches between body and seat; body arms are outside of chassis frame.

Made to fit any chassis.

With production about to begin on this new model and every indication of a nation-wide demand, we again recommend that prospective buyers of this type of equipment communicate without delay.

Particulars upon request. Address all inquiries to Detroit.

Wood Hydraulic Hoist and Body Co.

Sole Manufacturers

NEW YORK **DETROIT** CHICAGO

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KisselKar Truck used by A. W. Gerstner Co.

KISSELKAR TRUCKS

Light delivery to the heaviest duty ably performed by five sizes of KisselKar Trucks ranging in price from $1085 up to $3750.

DEALERS

Many Kissel dealers trebled their truck sales in 1916 over 1915. The reasons—superior quality and unusual price value.

There is an extremely attractive 1917 proposition open for a few more desirable dealers.

A. W. Gerstner Company, one of the live and progressive hardware concerns in New York City, find that no matter the ***amount of work*** or ***length of delivery runs,*** their KisselKar Truck is ***always on the job, day and night.***

The reliable Kissel-built engine insures ***uninterrupted delivery schedules.*** In and out of New York's congested streets its ***flexibility*** is that of a much higher priced truck.

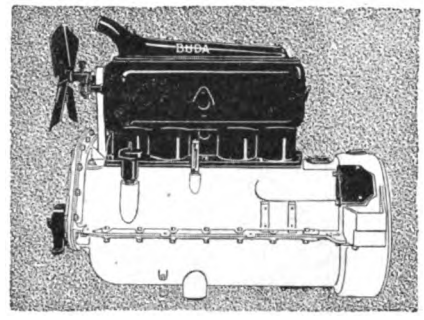
The Kissel ***built-in*** strength, perfected worm drive rear axles and other Kissel structural superiorities insure ***continuous service at low upkeep.***

Let us send you information and data on how KisselKar Trucks are solving transportation problems in ***your line of business.*** Send for specifications and photos.

KISSEL MOTOR CAR CO., Hartford, Wis.

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"LET US HAVE THE FACTS"—No. 3



ACCESSIBILITY

Two motors of different make may be equal in quality, skill of manufacture and performance—at first. In performance one soon falls behind. It lacks a most important feature of design—accessibility. The necessary adjustments cannot be made easily and cheaply, and as a result they are not made as often as they should be.

The BUDA MOTOR

of today has not been *designed* in the strict sense of the word. It has been *developed* in accord with the BUDA policy along lines which long experience in practical use has proved the best.

Extremely high mechanical efficiency and accessibility have been developed side by side. Buda records for durability, power and torque are well known. Buda accessibility has been as fully attained.

The BUDA MOTORS for cars, trucks and tractors bear the closest technical examination. Try it. Ask for

The new truck motor catalog containing full specifications.

THE BUDA COMPANY, HARVEY (Chicago Suburb) ILLINOIS

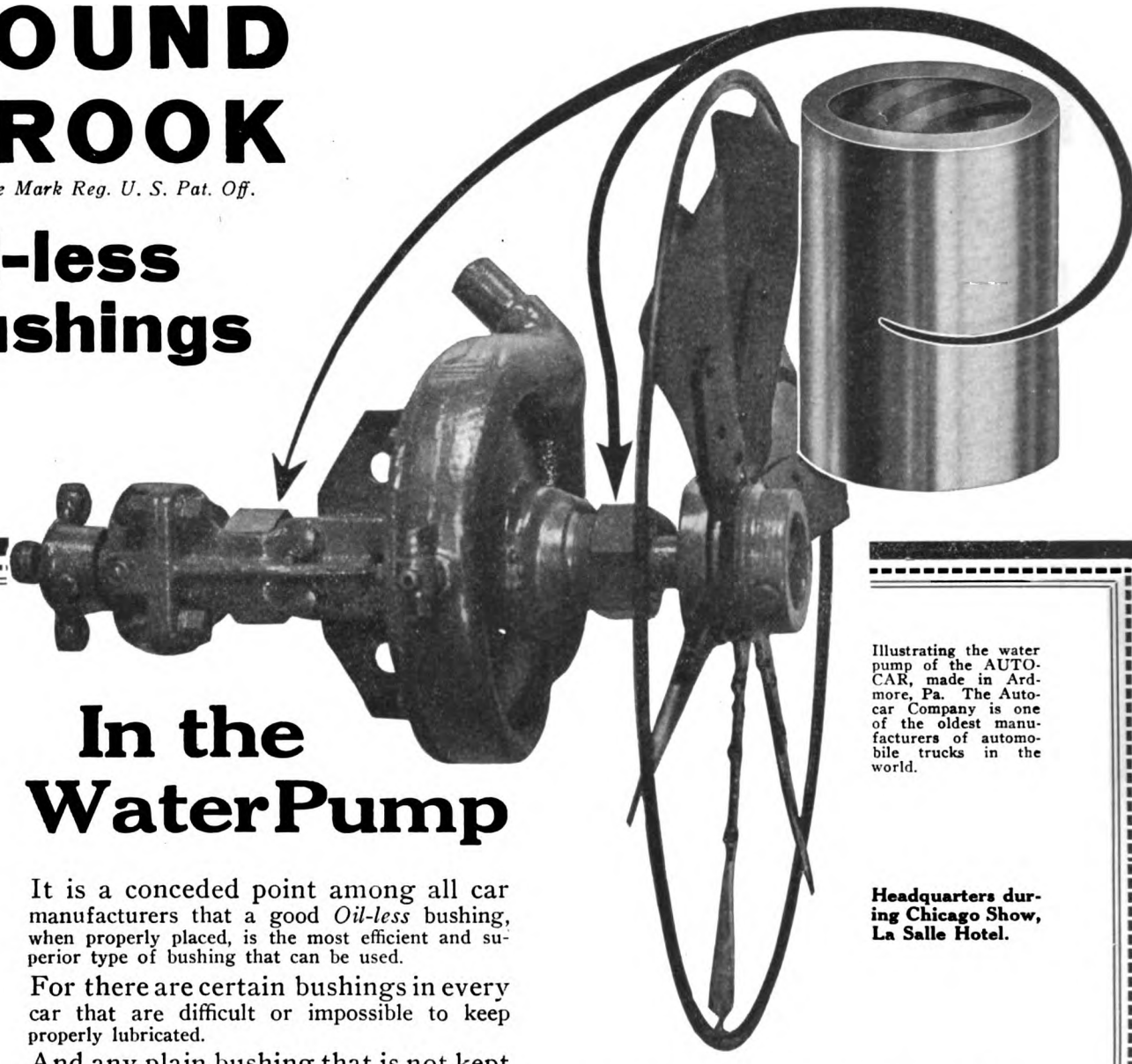
THE BUDA COMPANY
BUDA MOTOR
"The part to buy the car by"
ESTABLISHED 1887

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BOUND BROOK

Trade Mark Reg. U. S. Pat. Off.

Oil-less Bushings



Illustrating the water pump of the AUTOCAR, made in Ardmore, Pa. The Autocar Company is one of the oldest manufacturers of automobile trucks in the world.

Headquarters during Chicago Show, La Salle Hotel.

In the WaterPump

It is a conceded point among all car manufacturers that a good *Oil-less* bushing, when properly placed, is the most efficient and superior type of bushing that can be used.

For there are certain bushings in every car that are difficult or impossible to keep properly lubricated.

And any plain bushing that is not kept properly and continually lubricated, *wears out fast.*

For this reason you will find incorporated in all quality built cars and trucks a number of *Genuine Graphited Oil-less Bushings.*

Oil-less Bushings require no lubrication to give efficient service, for they contain within themselves sufficient lubrication to last their lifetime.

They are oiled for life when they leave the factory, and thereafter require no further attention.

In the center of the AUTOCAR water pump, illustrated above, are two BOUND-BROOK *Oil-less* Bushings.

Particular attention is called to these water pump bushings, for many have thought that running in water and anti-freeze solutions was not feasible with this type of bushing.

Not only the AUTOCAR Company but a number of other well-known manufacturers as well have been using BOUND BROOK *"Graphite and Bronze"* Oil-less Bushings in their water-pumps for years with the greatest of success.

Experience has proven that BOUND BROOK Oil-less Bushing conserve the life of the shaft and thereby greatly add to the efficiency and service life of the pump.

Bound Brook Oil-less Bushings are made only "to order."

All Genuine Graphited Oil-less Bushings have always been made at Bound Brook, U. S. A.

BOUND BROOK OIL-LESS BEARING COMPANY

Specialists in the Manufacture of Oil-less Bearings for more than a Third of a Century

BOUND BROOK **NEW JERSEY**

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To Dealers

Duplex truck production will be trebled with the completion of additional factory buildings.

An opportunity is offered high grade, established dealers to become distributors for the Original Four-Wheel Drive Truck—the super-strength truck that hauls capacity loads anywhere.

Wire or write today for complete specifications and dealer proposition.



Duplex 4-Wheel Drive Utilizes All Motor Power

All four Duplex wheels **work.**

The front wheels **pull** with just as much driving power as the rear wheels **push.**

As a result there is **no power wastage.**

Utilization of all power—**all energy generated by the motor**—explains the wonderful haulage performances of the Duplex.

The Duplex, loaded to capacity—**3½ tons**—has the additional power to pull from two to three trailers through snow, sand or loam, or up grades that any rear wheel drive truck would find difficult to negotiate with only its capacity load.

Less motor power is used by the Duplex than by rear wheel drive trucks of similar capacity—because the motor power in the Duplex is applied with twice as great effect—**with double efficiency.**

Operating **costs are greatly reduced** as a result.

The Duplex travels 30 per cent farther on a gallon of gasoline than rear wheel drive trucks of equal weight and motive power.

Duplex tire mileage is nearly one-third greater.

And the extremely simple construction of the Duplex **reduces upkeep expense** to the minimum.

Our 1917 catalog will interest you. It explains in detail how the Duplex is built to lower haulage costs. Send for it today.

DUPLEX THE ORIGINAL 4 WHEEL DRIVE

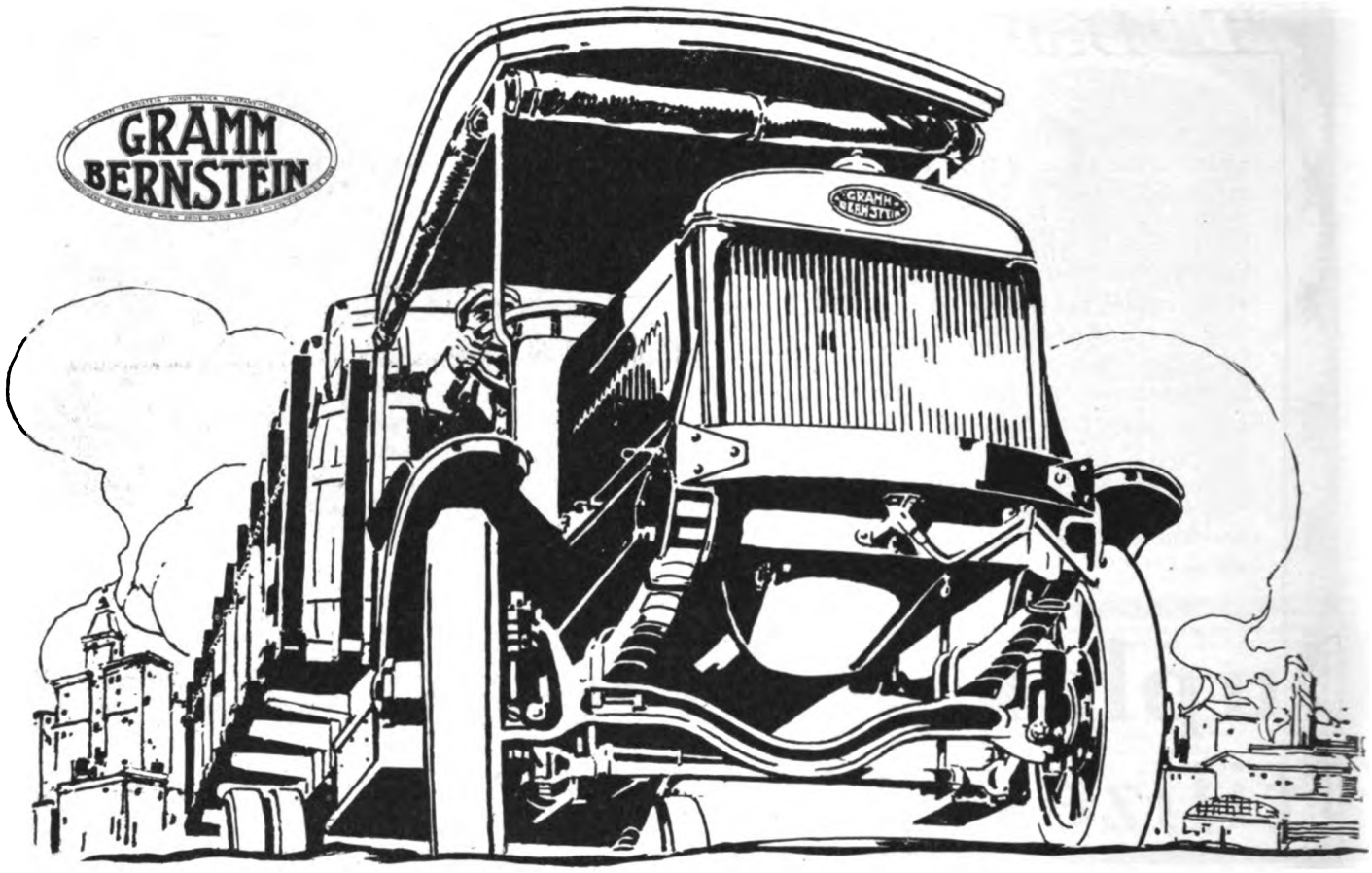
ADDRESS ALL COMMUNICATIONS TO DEPT. 107

DUPLEX TRUCK COMPANY

LANSING MICHIGAN

DUPLEX THE ORIGINAL 4 WHEEL DRIVE

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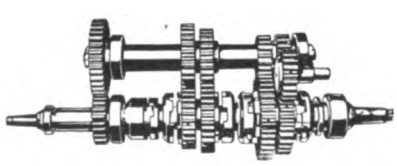
Back of Gramm-Bernstein Dealers

Is a support unusual in its character.

Not only do they represent a motor truck of proven quality—the pioneer of sixteen years—but there's a distinct personal interest and help given them from headquarters. At each G-B dealer's command is the assistance of the highest type of motor truck salesmen—men whose ability to close prospects is well established.

All truck requirements are met with the G-B complete line. Each model—from 1 to 6 tons capacity—is a master model. Each one is built upon those G-B exclusive features that always insure perfect performance.

We want you to consider the G-B sales plan—it's broad, practical and founded on experience. G-B dealers are prosperous and this plan is attracting the country's best dealers. Write today for complete particulars. Now is the moment for you to act. There is no obligation in investigating the G-B truck and sales-plan.



Can't Be Stripped

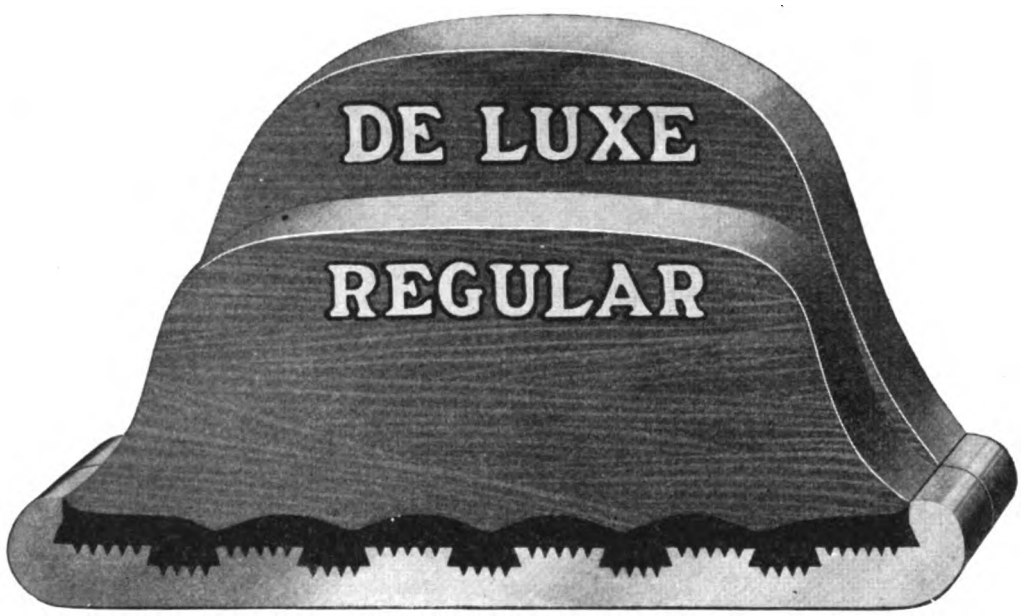
The G-B transmission defies careless and inexperienced drivers. All gears are always in mesh; no shifting—no stripping.

Gramm-Bernstein Motor Truck Company

13 Gramm Blvd., Lima, Ohio, U. S. A.

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Cut Down Expenses
with
GOODRICH DE LUXE TRUCK TIRES



You reduce both operating expenses and depreciation charges when you equip your trucks with **Goodrich De Luxe** truck tires. They make lay-ups for tire changes less frequent—likewise lay-ups for repairs to the truck.

The deeper tread absorbs much of the vibration so destructive to truck mechanism. It means long life to the truck as well as to the tire. This double saving gives truck users another reason for saying that **Goodrich De Luxe** truck tires deliver "Velvet Mileage."

Prove this conclusively by using our Motor Truck Expense Record Books which we furnish upon request.

THE B. F. GOODRICH Co., Akron, Ohio

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive $1095

Two-Ton Worm Drive $2200

Three-and-One-Half-Ton Worm Drive $3100

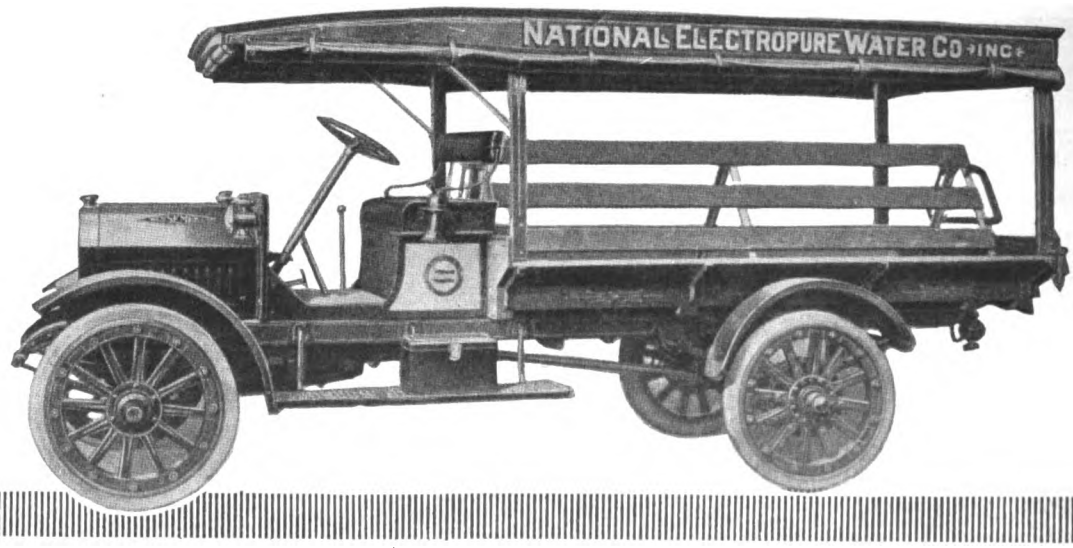
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

Bessemer Motor Truck Company — Grove City, Pa.

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State



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Smith Form-a-Truck

$350

F.O.B. CHICAGO

The heavy portion of illustration shows the Smith Form-a-Truck attachment which carries 90 per cent of the load, bolted to the power plant with a vise-like grip.

New General Executive Offices
SMITH MOTOR TRUCK CORPORATION
Michigan Avenue at Sixteenth Street, Chicago, Illinois

The Most Valuable Dealer Franchise in the Motor Truck Industry — And We Prove It

The Smith Form-a-Truck dealership is the most valuable sales franchise in the motor truck industry.

It is a guarantee of bigger earnings than are possible with any other make of motor truck or motor truck attachment.

It immediately places the dealer in the position of being the biggest man in his territory in motor delivery or hauling.

The facts are all definite; they are based on business actually in hand.

Shipments of Smith Form-a-Trucks in January of this year were 1,277. In February, 2,075.

March 5th factory production reached a total of 200 a day.

And shipping schedules for the month of March are 5,000 for orders on hand.

Orders on hand for April delivery practically guarantee a shipment of 10,000 Smith Form-a-Trucks in that month.

A total of 18,000 Smith Form-a-Trucks sold and shipped in the first four months of this year is practically guaranteed.

This is 80% greater than the entire production for 1916.

And in 1916 more Smith Form-a-Trucks were sold than all other makes of attachments combined, or any other one make of motor truck.

Orders are coming from every part of the country—every line of business. Our entire planned production for 1917 was 20,000—practically reached the first four months.

But shipments will continue to be made promptly, even on this tremendously enlarged production.

We have the material—the money—the manufacturing facilities. We can take care of any demand, regardless of size, that we have scheduled sixty days in advance.

Big sales and positive guarantee of deliveries are what make the Smith Form-a-Truck dealer franchise the biggest asset in the motor truck industry. If the territory you are in is not already closed, apply now—by wire.

SMITH MOTOR TRUCK CORPORATION
Manufacturers of Smith Form-a-Trucks
Executive Offices and Salesroom, Suite 911 Smith Form-a-Truck Building, Chicago
Eastern Branch, 1834 Broadway, New York — Kansas City Branch, 1008 Grand Avenue — Southern Branch, 120 Marietta Street, Atlanta
Pacific Coast Branch, Pico and Hill Streets, Los Angeles, Cal. — Omaha Branch, 2212 Harney Street

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WARNER

GEAR COMPANY OF MUNCIE



Warner Truck Transmissions

A Mark of High Quality and Long Service In Any Motor Truck

TRANSMISSIONS · CLUTCHES STEERING GEARS · DIFFERENTIALS

WARNER GEAR COMPANY, Muncie, Indiana

Detroit Office, 967 Woodward Ave.

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HONESTY

THE success of the Dearborn One-Ton Truck Unit is built upon honesty—honesty in design, honesty in materials, honesty in construction, honesty in advertising, honesty in selling. The results of this honest policy under which the Dearborn is made are found in the big, sound, growing, money-making businesses which Dearborn Dealers have established.

The field for the Dearborn Unit has hardly been scratched—it is practically unlimited. In *your* town and territory there are many *sure* prospects for the Dearborn. General merchants, expressmen, lumber dealers, farmers, dairymen, truck gardeners, manufacturers, contractors, etc.—these people need the Dearborn and will buy it. Almost without exception they are people who wouldn't think of paying $1500 for a truck (the average price of a one-ton truck), but they are interested in the Dearborn Truck because it can be obtained for $350 and a Ford chassis, and will give them just as strong and dependable a one-ton truck, which they can operate at less expense than a horse and wagon.

$350 and a Ford, New or Old, Make a

FORD-DEARBORN One Ton Truck

The Dearborn Unit is as well and carefully made as any truck chassis on the market. It is manufactured in our own plant and we guarantee it to be right. It is a simple matter—the work of only a few hours—for an auto mechanic to attach the Dearborn Unit to a Ford chassis.

90% of load is carried on sturdy rear axle and heavy truck wheels. Full 9-ft. loading space; heavy artillery type wheels with guaranteed hickory spokes and felloes; solid rubber tires. Standard tread, same as Ford front wheels. Baldwin roller chains and Baldwin steel sprockets. First quality materials used throughout.

Remember this: The Dearborn Truck Company is *not* a stock-selling organization. It is a real manufacturing company with a big, modern factory, making carload shipments daily.

Write today for the Dearborn Dealers' Proposition.

Dearborn Truck Company, 1230-64 S. Campbell Avenue, Chicago, Ill.

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"Costs less to buy and less to run"

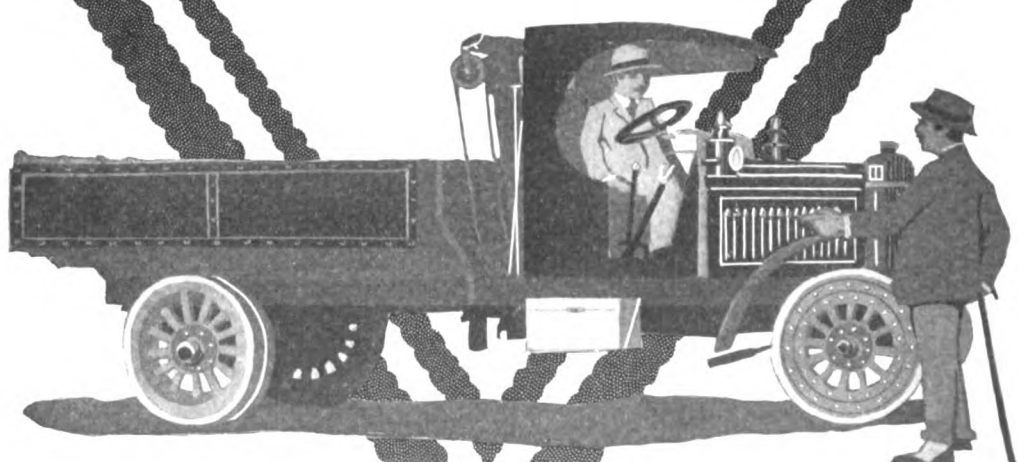
ATTERBURY

A man who bought a two-ton Atterbury said this the other day:

"I was looking at a boast published by the makers of a truck which costs more to buy than does the Atterbury. This other maker showed, in detail, items of upkeep. We happened to compare these with our own experience with the Atterbury, and have found—not only that the Atterbury costs less to buy, but also costs less to run."

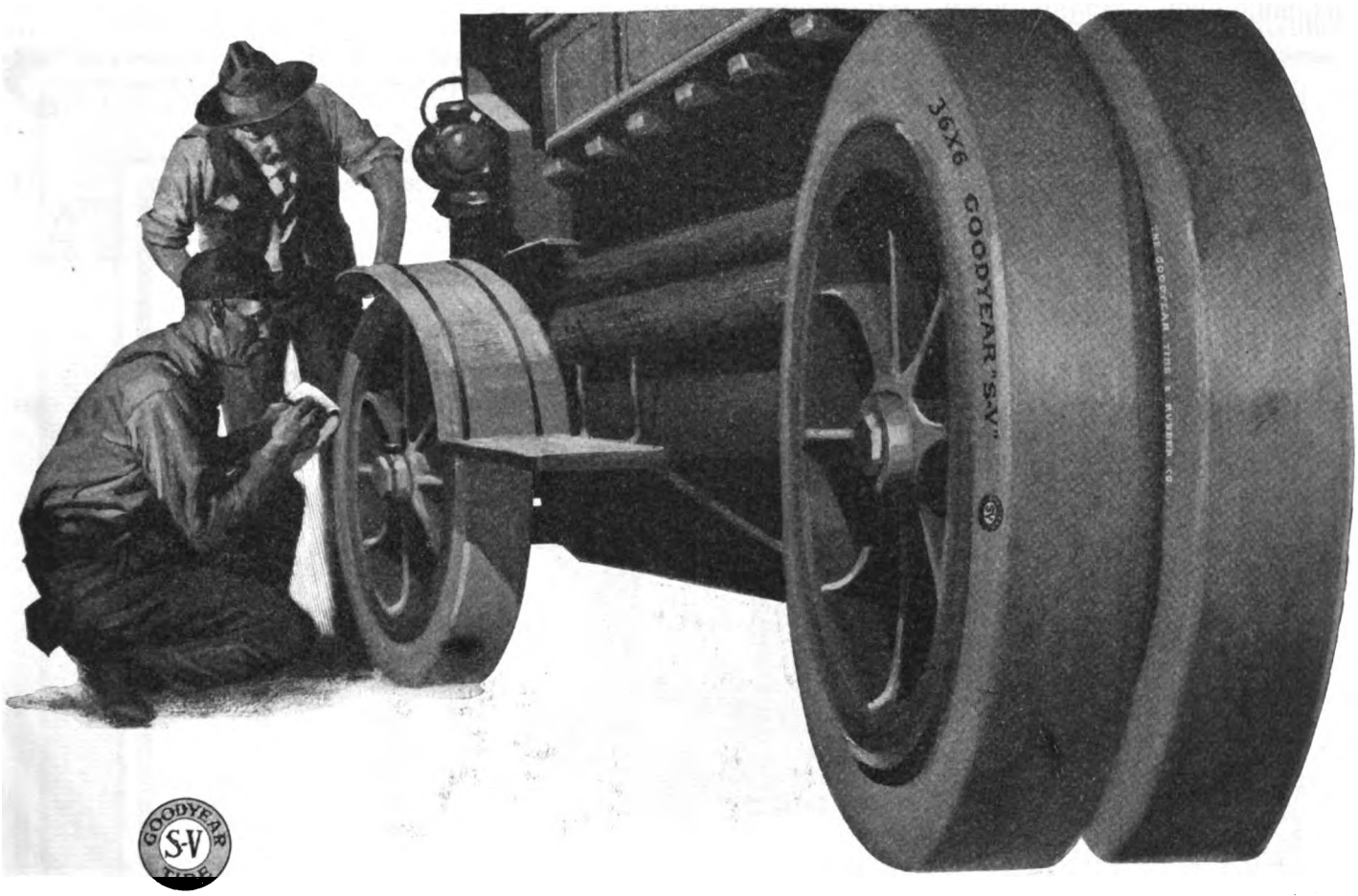
To Dealers:—Think how easy it will be to sell that man another Atterbury! Many dealers have built profitable Atterbury agencies. Investigate the Atterbury proposition.

Atterbury Motor Car Co.
Buffalo, N. Y.



ATTERBURY

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Know Your Truck Tire Costs

Some business men know where every pencil goes, and save the stubs, but still operate fleets of motor trucks *not* equipped with odometers.

Mileage, therefore, is not measured and they have no accurate basis for figuring cartage costs.

The trifling expense of the recording device is saved and all exact knowledge of truck operation is lost.

We urge executives in all lines of business to remedy this condition, to install accurate cost systems in their trucking service, based on the sound truth of odometer records.

We urge this in self-protection, knowing that where such records are kept, the superior economy and service of Goodyear S-V Pressed-On Truck Tires must be proved.

Men who keep such records send us astounding accounts of S-V performance—mileages exceeding 40,000 in strenuous city bus service, and more than 20,000 on rough country routes.

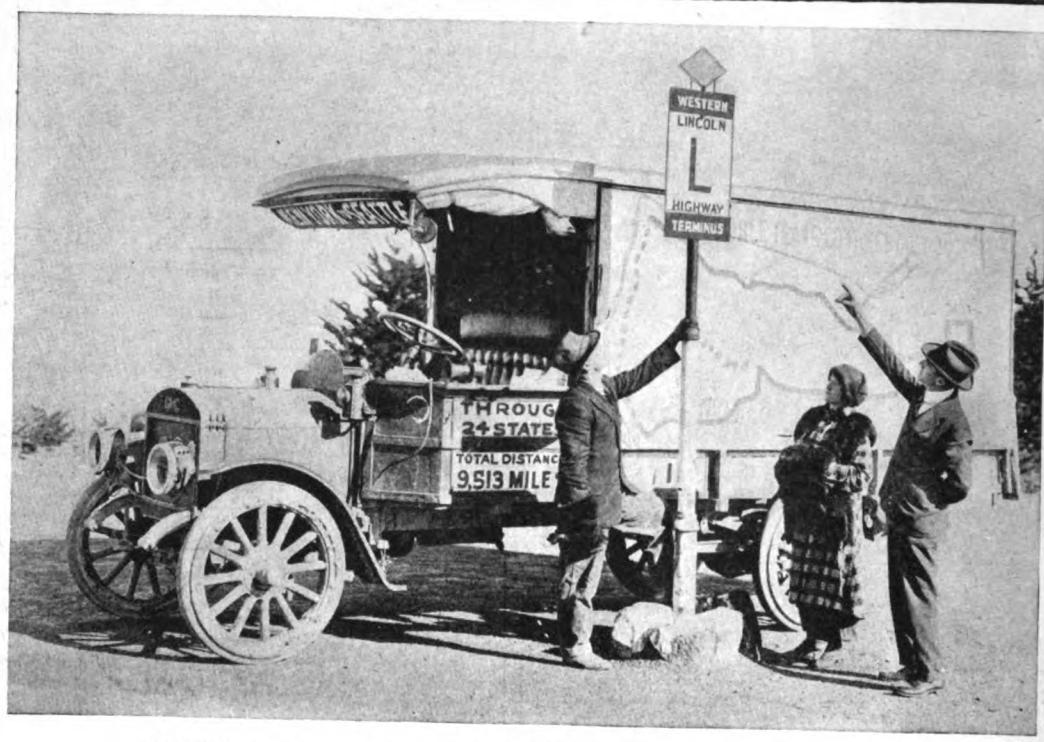
Having no direct interest in the sale of odometers we urge *you* to buy one of these inexpensive, truth-telling instruments for each truck you have in service.

Because this will be your first step toward standardizing on S-V as your truck tire equipment.

The Goodyear Tire & Rubber Co.
Akron, Ohio

GOODYEAR
AKRON

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GMC Truck at the Western terminus Lincoln Highway, after nearly completing the most remarkable undertaking ever attempted by a Motor Truck.

1½ Ton GMC Truck With Capacity Load Completes Trip Seattle to New York and Return

Covers more than 9,000 miles—every foot of the way on its own power.

Masters the most gruelling test ever experienced by motor truck or car.

Back of the gripping story of this remarkable trip there is a vital message for every business house.

The trip is described in an illustrated booklet just issued. Write today for the number of copies you'll require.

GENERAL MOTORS TRUCK CO

One of the Units of the General Motors Company

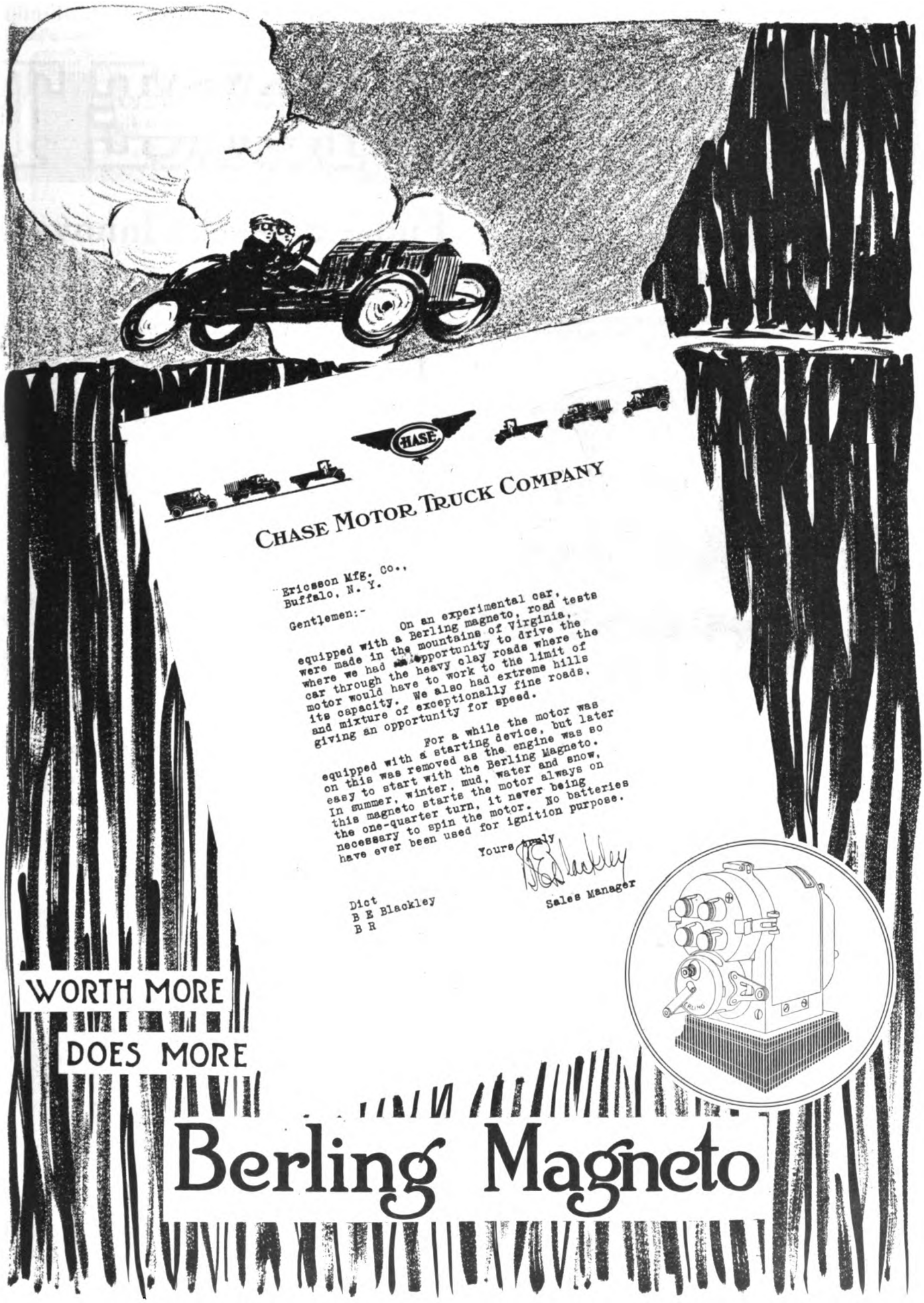
PONTIAC, MICH.

New York Boston Philadelphia Chicago St. Louis San Francisco

(172)

GMC
GENERAL MOTORS COMPANY
TRUCKS

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The PULL-MORE TRUCK

FRONT DRIVE

THREE POINT SUSPENSION

Pull-More—An Innovation

Never in the history of the motor truck industry was there a concern ushered into the manufacturing field under more auspicious circumstances than those attending the Pull-More Motor Truck Company, a new $1,000,000 corporation, the strongest financially to ever start manufacturing trucks exclusively. Combined with this immense amount of capital is an organization composed of men with enviable manufacturing and executive records, whose sole object will be to build a truly quality truck on the most economical basis that both brains and money can produce.

The Pull-More Company is bringing out an innovation in motor truck construction, embodying—front wheels drive—a power plant thoroughly accessible in less than thirty seconds—detachable rear or carrying unit—absolute flexibility and freedom from distortion and strains, by means of a three point suspension for both front and rear units.

These features of design and construction stand out preeminently for efficiency, convenience and economy—will enable the Pull-More truck to haul more freight, over a longer period of years, at a much lower cost for operation and maintenance, than any other motor vehicle.

ACCESSIBILITY

Pull-More Motor Truck Co.

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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UCK Will Pull More



These features of design and construction have been originated, developed and perfected by Pull-More, have been completely protected by broad, basic patents, and cannot be had in any other truck at any price.

Salient Points

FRONT DRIVE

The engine and the drive, the power and its application, are where they belong—together. The power is more effective, the fuel consumption is less, the tire mileage is increased, universal joints are eliminated, **traction is bettered.**

TWO UNIT

Pull-More is a tractor truck, combining in one vehicle the advantages of both truck and tractor. It is built in two units, each unit performing one function—the rear section carrying the load, the front pulling the load. The power plant in front is free from load strains, and there is no operative mechanism in the rear to be strained or thrown out of alignment. The two units being separable, hours wasted in loading and unloading can be saved by pressing into service extra rear sections.

THREE POINT SUSPENSION

Pull-More trucks have three point suspension for both front and rear units. Strength and sturdiness are taken into partnership with complete, perfect, ideal **flexibility.**

ACCESSIBILITY

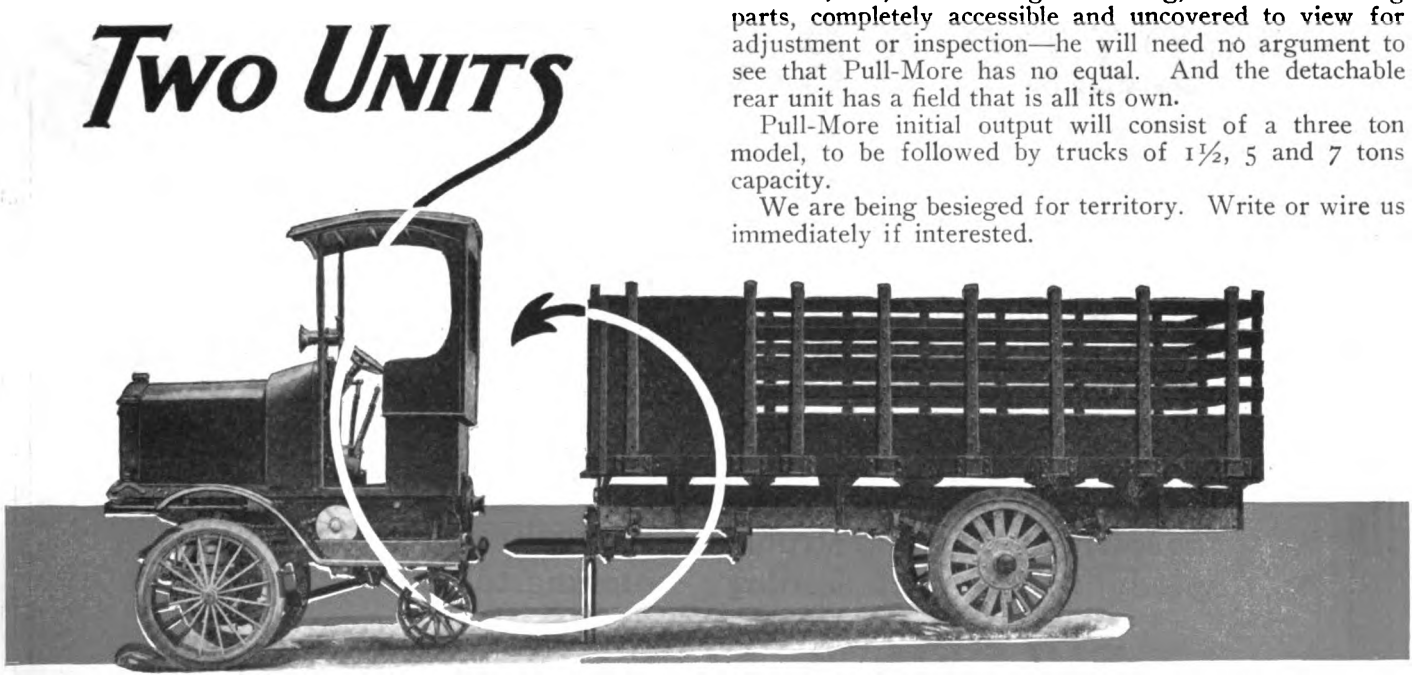
Complete, visible, workable access to every part of Pull-More power plant in **less than thirty seconds,** reducing repair bills from dollars to cents and time from hours to **minutes.**

Message to Dealers

This is a wonderful opportunity for dealers to secure an agency for a motor truck that will practically sell itself with a single demonstration—so convincing will be the showing of the front wheel drive, so obvious the advantages of its perfect **flexibility,** and when the buyer sees the Pull-More power plant opened up in **less than thirty seconds,** and, with the engine running, all of the working parts, completely accessible and uncovered to view for adjustment or inspection—he will need no argument to see that Pull-More has no equal. And the detachable rear unit has a field that is all its own.

Pull-More initial output will consist of a three ton model, to be followed by trucks of 1½, 5 and 7 tons capacity.

We are being besieged for territory. Write or wire us immediately if interested.



The Union Arcade, Pittsburgh, Pa.

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FULL POWER



Delivered to the Rear Axle

Silently—Economically

Truck manufacturers all over the country have endorsed Fuller Transmissions in the strongest way possible—that is, by buying them, after thorough investigation.

FULLER TRANSMISSIONS

Truck builders and engineers have placed themselves on record as strongly commending the silent efficiency, the durability and dependable consistency of Fuller Transmissions.

Truck owners are enjoying the splendid service of strong, speedy vehicles, of leading makes, wherein Fuller Transmissions link up power plant with carrying capacity.

Such combinations are the most reliable, the most economical, the strongest, smoothest, quietest and lowest-final-cost delivery vehicles running to-day.

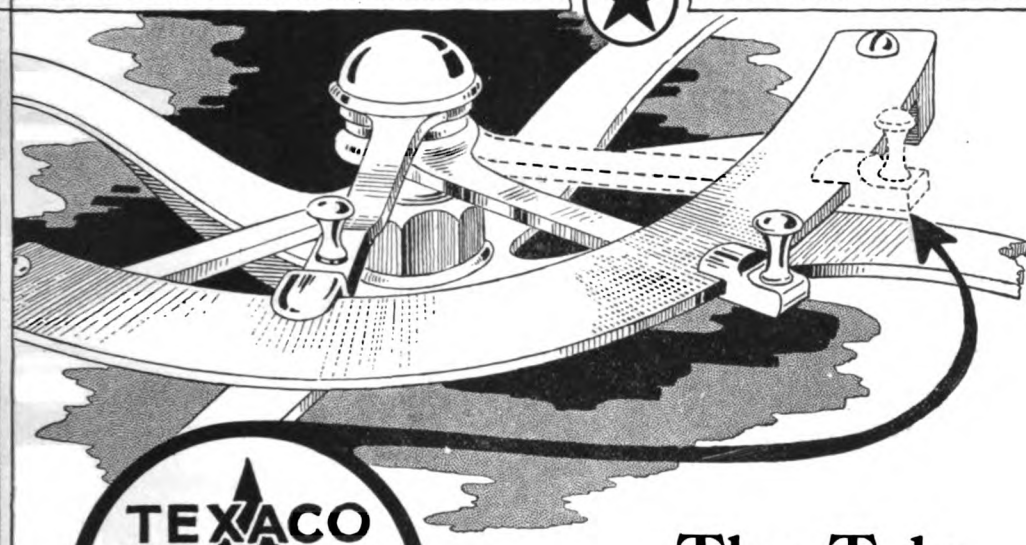
FULLER & SONS MFG. CO.

KALAMAZOO, MICH.

EARLE & BOGGS, 1790 Broadway, New York City

EASTERN REPRESENTATIVES

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TEXACO

REG. U.S. PAT. OFF.

The Tale The Throttle Tells

THE throttle of your car tells an interesting tale to those who will listen—a tale of power developed, of gasoline and oil consumed.

You know that when a motor is running at its best the throttle need not be advanced so far to obtain a given speed as when the motor is not quite up to par. This means that it takes less gasoline in one case than in the other to go a given distance.

Try this simple test—mark lightly on the sector the point to which the "gas lever" must be advanced to obtain a speed of twenty miles an hour on a level road with the motor oil you are now using. Then drive over the same road at the same speed after having substituted for the old oil

TEXACO MOTOR OIL

Unless your car is one of the exceptions which help to prove all rules you will find that the lever does not reach the mark previously made. What does this show? Simply, that with Texaco Motor Oil, you are getting more power and using less gasoline.

Why does Texaco Motor Oil produce this result? For several reasons.

Texaco Motor Oil is a southern oil with an asphaltic base. It is admitted by the most eminent authorities that the hydrocarbons composing the asphaltic base oils *cannot* form hard carbon.

Texaco Motor Oil stands up well, maintains its body and lubricating qualities in use because it gives a good seal to the piston and rings and prevents leakage of gasoline into the crank case.

Because of these facts Texaco Motor Oil enables a motor to run at its highest point of efficiency, enables the gasoline to deliver its maximum power, and as a result gives high mileage.

You can judge a motor oil very fairly by its color. Compare Texaco with others. Note its clear, clean color.

When you buy motor oil buy Texaco. The best way, the safest way, is in 1 or 5 gallon cans.



THE TEXAS COMPANY

17 Battery Place New York

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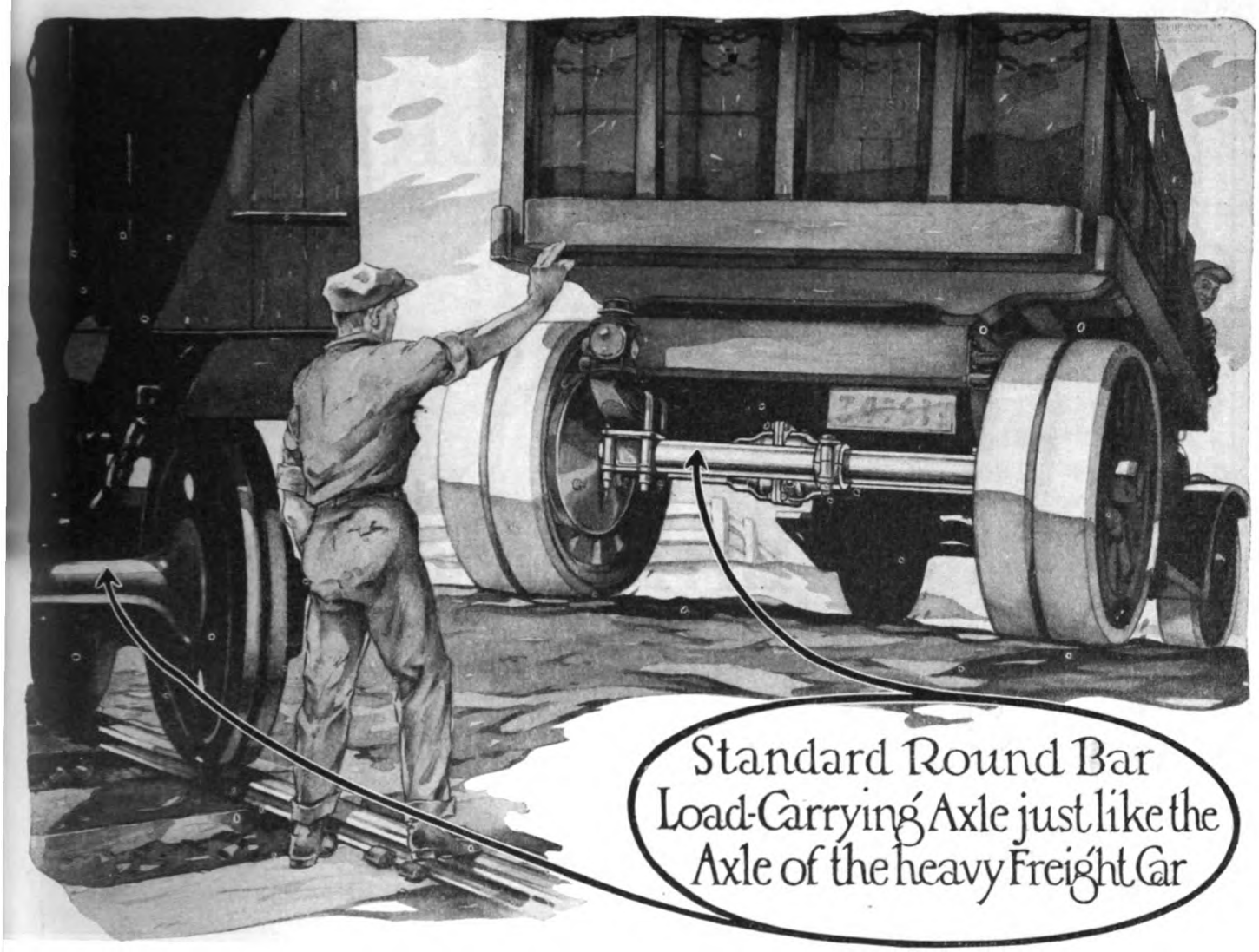
THE ONLY TRUCK HAVING EVERYTHING NECESSARY ON IT—
—WHEN YOU BUY IT!

Commerce

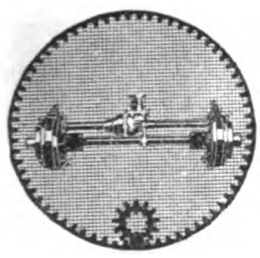
ONE TON — MODEL ES
New Model just added to Commerce Line. New York. Type, stake job. Completely equipped.
$1390

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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Profit By Experience



The great railways of the world, masters in transportation equipment, employ a one-piece, standard round bar load-carrying axle on powerful locomotives and heavy freight cars.

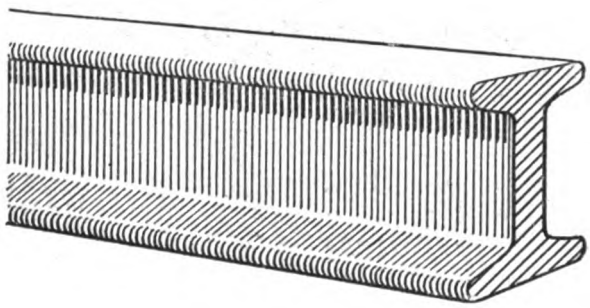
The Russel Internal Gear Axle is the only American made shaft drive axle using a standard round bar load-carrying axle.

Profit by the experience of the masters in transportation equipment—and specify a Russel axle on your next motor truck.

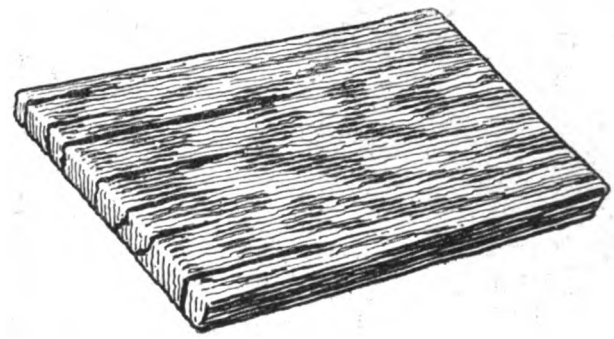
Russel

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IT'S AS DIFFERENT



As THIS is



From THIS

Has No Grain **VEHISOTE** No Laminations

It differs from a grained or laminated material largely as steel differs from wood.

Steel is a fibrous material made by a fluxing and molding process. So is VEHISOTE.

Wood grows in rings or layers and is essentially a laminated material—a succession of separate fibres clinging to each other.

Wood, like any laminated or layer material, is susceptible to splitting and separation of its fibres.

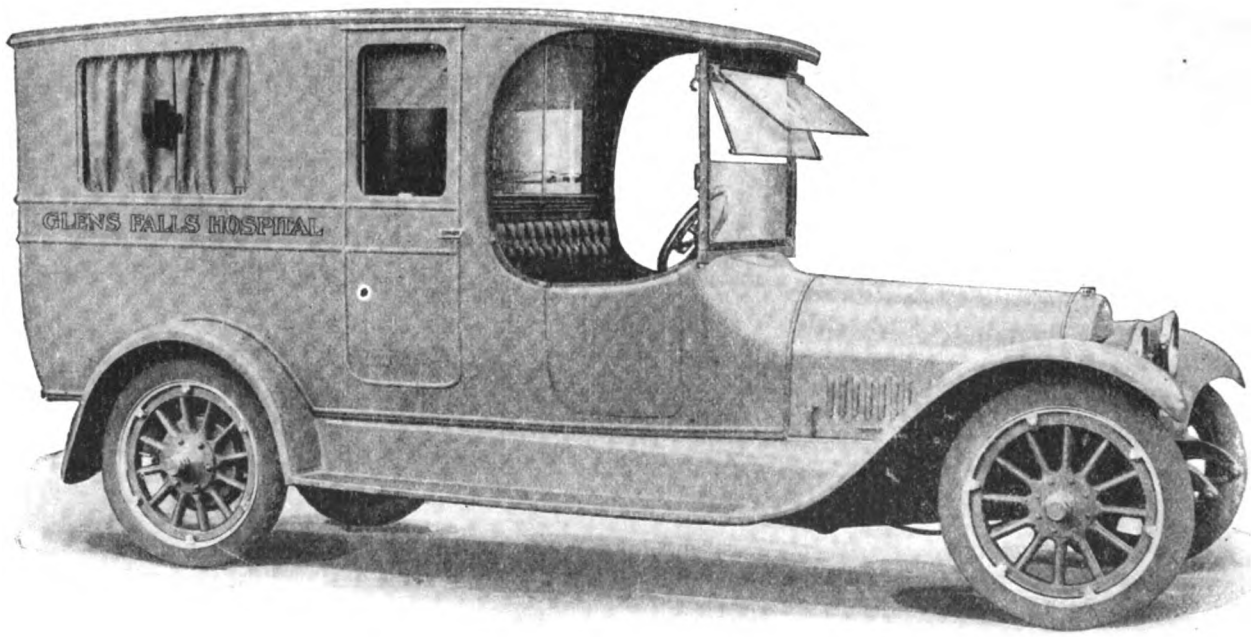
Homogeneous materials like VEHISOTE, in which the fibre is fluxed and run together, cannot split.

Steel is heavy. VEHISOTE is light.

Steel is expensive from an up-keep standpoint. VEHISOTE is economical.

From every standpoint VEHISOTE is an ideal material for vehicle body panels.

Try it.



This beautiful ambulance, built by the August Schubert Wagon Company, Oneida, N. Y., shows the possibilities of VEHISOTE when handled with expert knowledge and care in producing bodies the equal of aluminum panels without the same expense.

THE PANTASOTE COMPANY

11 Broadway, New York
Scovel Iron Stove Co., San Francisco

People's Gas Building, Chicago
Penobscot Building, Detroit

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The COMMERCIAL VEHICLE
Read by Business Men

Published on the first and 15th of every month
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New York City

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI April 15, 1917 No. 6

Lessons of European Motor Transport Will Avoid U. S. Blunders

Roads of Paramount Importance—Standards and Repair Facilities Needed

AMERICAN motor truck makers are confronted with the question whether they will have to build special models of army trucks or not. The War Department has been working on specifications of a military truck and has recently made several modifications in these so that they more nearly coincide with existing trucks built for commercial uses. There are still many special features in connection with the army trucks which would call for considerable alteration in existing models and which would very materially delay deliveries.

Are Special Designs Needed?

Whether America should have special army trucks, let us say of 1½- and 3½-ton capacity, is a debatable question. It is also open to question whether a special army truck is necessary. As a result of the Mexican experience, it has been argued that a commercial truck is not robust enough to stand up under severe army service. We acknowledge this, particularly if the service is similar to that on the Mexican border, but we question the advisability of subjecting trucks to such service. It might be necessary in emergency, but it is certainly not necessary in scientifically planned warfare as carried out in Europe to-day.

Europe very soon learned the lesson that motor trucks require roads, and that it is cheaper and quicker to build good roads for your trucks than to bring out new models of trucks. Italy when she entered the war immediately set an army of 20,000 men building roads and has kept that army at road-building ever since. Her road building is carried out as scientifically as her motor ambulance service or her convoy service for munitions.

On the western front in France similar road-building experiences were met with and similar plans for construction put through. Practically all of the men and ammunition for the Verdun defense were transported over one road by motor truck. There was no railroad to serve. United States army motor trucks assisted in this work. Our trucks gave a good account of themselves. We did not have reports of their not being sufficiently robust. They could not have stood up and done the service without good roads to travel over. A motor truck should have a good road to travel over in war zones. This is just as imperative as ambulance service or supply columns, or field repair shops, or searchlights, or other army equipment.

If our trucks have given such satisfactory service in Europe, it is a natural conclusion that they would give satisfactory service in this country. It might be good policy, instead of building our trucks stronger, to build our roads better.



Eighty-five men of the Tenth Company, Coast Artillery Corps, San Francisco, Cal., made a record run from San Francisco to Half Moon Bay recently in a trip which demonstrated the efficiency of motor vehicles for military purposes. The excursion was made to repel an imaginary invasion from the sea. The troops used twenty-two Studebaker motor trucks and cars, supplied by the local distributor, the Chester N. Weaver Co. The road was mountainous, full of curves, and 39½ miles long. The trip took 1hr. 15 min., and was without any accidents

Good Roads Mean Higher Speeds

A sidelight on this truck situation comes from Italy, where the 1½-ton truck uses a relatively small motor and averages 20 to 22 miles per hour. In our army specifications the same capacity truck has a much larger motor and its rated speed is put at 14 miles per hour. The explanation of this difference in specifications is found in roads. Good roads will make the truck with a small motor capable of 22 miles per hour, whereas with poor roads the larger motor and the same truck will have difficulty making its 14 miles per hour.

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The War Department should not lose sight of the difficulty connected with securing a special war chassis. Manufacturers can only be expected to produce such on assurances of orders commensurate with the expenses of bringing out a new model. In emergencies such as the present one the time is hardly opportune to demand a special military model of any factory. Months will be required to make perhaps minor changes, which when done would not improve the vehicle. If government specifications are to be required, the proper time to make such is not when you are crossing the stream, but in times of peace. It took years for France to put its subsidy system across, and it was done in times of peace. The same was true in England.

Faults of Our Road System

In America roads have played a small part in previous wars. To-day they would have to play a much larger part, and yet our great Mississippi Valley, the granary of the country, is practically without roads that are usable 12 months in the year. Scarcely 12 per cent of our roads have improved surfaces.

Another unfortunate fact in respect to our road system is that there is little attempt at co-relation of different systems. There are few through routes. Such national roads as the Lincoln Highway, National Old Trails and Dixie Highway may be dismissed at once, since they are for the most part merely on paper—they are blazed trails for the most part, innocent of any surfacing, and where surfaced, to a great extent inadequately so. Our surfaced roads, furthermore, are principally on the two coasts. They are laid out on radial systems contiguous to urban centers and having no relation with other systems about other centers.

Mexico No Sample

Real war service is very different from anything our army has ever experienced with trucks. Mexico is no sample of what our allies are doing with trucks and what we, too, should be prepared to do. There most of the transport work is done at night, without lights, this permitting the goods to be transported without observation by the enemy. They operate at times 36 hours at a stretch, and the drivers are often on duty 20 hours on a shift. The entire transportation scheme is organized on railroad principles. Just as the Allies would no more think of attempting truck operation without good roads, kept good, so they consider a definite schedule, definite traffic control and dispatching as essential to a system of truck trains as to a railway system.

Every train has its allotted place on the road and its standard rate of speed. The roads are policed by traffic officers, who see that the schedule is adhered to and that all rules of the road are observed. If a truck is disabled, it is speedily pulled off the line of travel and efficiently taken care of without obstructing other traffic or holding up the other units in its train.

There is little in our late experience on the Mexican border with our group of 2300 trucks to parallel these conditions. Down there the trucks averaged only 3933 miles apiece for the fiscal year, hauling but 636 tons apiece, and they came out of it with 40 per cent in bad shape. Some of the trucks were incapacitated in their short service. Tires were cut to pieces in hundreds of miles, where they should have lasted for thousands. They were as good trucks as they have in Europe—being for the most part replicas of our highly satisfactory contributions to the Allies' fleets. They went to pieces, they were out of service an average of 1 month 5 days apiece for repairs, because only a belated and ineffectual attempt was made to convert desert sand and rocks to some semblance of roads.

The engineers have had to learn to build stouter bridges than before required. Bigger pontoons have had to be built. It was found that old road-building methods would not do, for the speed and the weight of motor transport trains call for firm foundations and hard surfaces. It was found that efficient mechanical maintenance was imperative. It is essential that our army shall acquaint itself with these matters and prepare large corps of officers for the work. It is believed that this has already been started.

Essential to Train Drivers

The driver problem, in war and in peace, is a great personal equation that must be solved. The French found early in the war that more than merely a driver's license was necessary as a qualification for a military driver. They found that good drivers were scarce and that it was a grave error to recruit into the ranks men skilled in this trade as in others, while incompetents were assigned to transport trucks. They also discovered that efficient methods of instruction were essential.

Great driver schools were established accordingly and men otherwise ablebodied who had received wounds in the legs which would incapacitate them for infantry service, men beyond the military age or men with defective feet, were put through an elaborate system of training for war truck driving.

Many of the mistakes that were made in the early stages of the war can be avoided by America if we will but take to heart the object lesson before our eyes. All men who volunteer for army duty who have had experience driving motor vehicles should be given special training in quartermaster training camps or in the quartermaster work of such camps as Plattsburg, Fort Oglethorpe and Fort Sheridan.

Schooling French Drivers

A glimpse into a French training school is enlightening. Here the raw recruits are first given 4 days of training in the A, B, C of the motor vehicle. A cutaway chassis is first studied, and the names and functions of all parts are made clear. Next, the details of the chassis, such as the gearbox, magneto and carbureter, are made plain. Each man is given training in the handling of the controls on what might be termed a captive chassis—in other words, a chassis which is in operating condition but which is stationary on the ground.

The men are then given road instruction, starting with short runs on level ground for practice in steering, starting, stopping and changing gears. These runs are daily increased in length and take in more difficult road conditions until the man has learned to handle his mount with confidence and safety.

Next they are trained in convoy formation, so that by the time the man graduates he has passed all important tests. All along the course men are dropped out for proven unfitness.

Our Industry Prepared

As far as the trucks themselves are concerned we are already well prepared in essentials, for of all war materials which we have shipped abroad none has measured up so high in the estimation of Europeans as our motor trucks. If better war trucks than we produce right here in our own country are built, it is likely that we will build them. There are certain details, however, in which military service has shown the commercial design can be improved without in any way impairing the trucks' usefulness in industrial work.

The details in which trucks need improvement are relatively few. One of the primary requirements is a good type of bumper to protect the radiator from damage in case of collision. When it is considered that the trucks are operated in convoy formation, and that for reasons of necessary economy of road space they must keep fairly close together, and always in a straight line; that much of the work is done in pitch-black night without lights of any kind, and that under these conditions rear-end collisions are unavoidable, it will be seen how essential this protection is. Late experience seems to indicate that such bumpers should be both front and rear to prevent injury to the back of the body of the leading truck.

Detail Requirements

It is essential that towing hooks be placed at both front and rear in order to permit ready extrication from bogs and to allow a purchase for pulling a permanently disabled truck from the road. There should be provision for completely draining both the radiator and the cylinder jackets so that in freezing weather there will be no cracked cylinder jackets or burst radiator tubes.

The gasoline tank should be large and easily filled. It should not be necessary to raise the seat cushions to take on a fuel supply. Heavy sprags at the rear are most desirable. None of these things requires essential changes in existing designs.

Another form of standardization on a somewhat higher plane contemplates interchangeability of parts without identity of design. In other words, all war trucks should ideally have the same size of carbureter with a standard S. A. E.

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flange. They should all have standard magneto bases and drive couplings. Their radiators should all have mountings registering with the same template. Standard controls, such as recently adopted by the S. A. E., should become universal.

Any effort on the part of the government to standardize the particular type of design to be used in the main components, save in a very general manner, or to specify the analysis of steels or other materials, would defeat its own purpose. This would only increase the difficulty of producing trucks acceptable to the government, it would reduce the possible number which could be produced and the number of manufacturers who would expend the hundreds of thousands of dollars necessary to adapt their products to government requirements.

Among special types of vehicle which will be required for operation in roadless areas are tractors for artillery, four-wheel-driven types of truck for transport work close to the line or in newly occupied territory which the road corps has not yet had time to prepare for the regular truck trains, armored cars of the tank type, or modifications thereof, and road construction trucks and tractors.

In the required capacity of ordinary war transport trucks we have a useful lesson from Europe which our army has already partly learned. That is that the economic principle that freight is moved cheapest in large units applies as well to war as to commerce. With the necessity of building special roads and bridges as part of war transport thoroughly understood, it is readily apparent that we may safely exceed the pristine maximum of 1½ tons in capacity. In France 3½ tons has been found the ideal war truck capacity, and our own army is now in possession of a large number of 3-ton trucks which it found were highly effective even in the roadless areas of Chihuahua. To the student of commercial and military transport it is apparent that with an efficient road corps trucks up to 5 tons capacity can be used by the army with profit.

Some Structural Essentials

A few points of construction which experience has shown are essential comprise four-speed gearboxes, a reserve supply of fuel, gravity fuel feed, brakes of ample capacity and either a self-locking differential lock or a differential lock. Steel wheels are also a necessity for a number of reasons. In dry, hot countries wood wheels dry out and fall apart and in war service if a truck catches fire, wood wheels will burn and thus prevent the vehicle from being towed home when the fire has burned itself out. Steel wheels permit such wrecks to be salvaged in the majority of instances.

One of the greatest sins perpetrated against the truck equipment of our army so far has been overloading, due partly to the error made some years ago that all army trucks must be of 1½ tons capacity with an overload capacity. The dictates of military necessity are absolute, and it is therefore not surprising that the loads on our army trucks more often exceeded 3000 pounds than not. Due in some measure to the insistence of a group of motor truck operators in New York, under the auspices of the Motor Truck Club of America, who waited upon the secretary of war last year, the army bought a number of 3-ton trucks—nearly a thousand, in fact—and this has reduced the abuse to some extent.



Immediately upon the declaration of war on Germany, Pasadena citizens donated this G.M.C. ambulance to the Seventh Regiment, National Guard of California. The ambulance is designed in accordance with U. S. Army standards and is manned by members of the American Red Cross

Efficient Traffic Control

It must also so organize the transport of the army that trucks can be dispatched and assigned according to the work that is to be done so that there will be no surplus of vehicles here and surplus of work there. It must so lay out the work of the trucks that they will be used at their greatest efficiency, so that instead of an average mileage of less than 4000 miles per year they will average closer to 30,000 miles per year.

While overloading must be avoided for the sake of the mechanical health of the vehicles, underloading must be avoided so far as possible for the sake of efficiency. Each transport truck should be equipped with folding or removable seats so that men can be transported and provision should be made by which stretchers can be carried for the transportation of wounded.

Efficient use cannot prevent wear and tear and a certain amount of accident, especially in war, where the effect of the enemy's fire is to be counted upon. For this reason it becomes essential that effective means for keeping the trucks in repair be provided. Roughly, repair service may be divided into three classes:

The first is rendered by mobile repair and machine shop trucks which accompany the trains and are ready to give instant roadside attention. In Europe, where the convoys are somewhat longer than ours, one repairshop truck accompanies each train of about 44 trucks. This truck is manned by competent mechanics and makes all repairs that can be made without recourse to a shop. It carries an equipment of small machine tools, such as a lathe, drill-press vise, a forge and anvil, complete hand tool equipment and a stock of the most-needed repair parts.

Temporary repair stations are established somewhat back of the line, such as at sub-bases, representing the backward terminals of the convoy routes. In these more serious repairs are made, a more complete stock of parts is kept and there are tire presses, etc. This is as far as anything but a wreck should go. Even a wreck would not be towed farther than this, for here it would be torn apart and the pieces not needed by the temporary repair station sent back to the central repair shop.

The central repair shop is a great clearing house of parts and repairs, being equipped about as completely as a truck manufacturing plant. Here the parts of wrecks are carefully disassembled and sorted into stock, each part being put in good condition. From this stock new vehicles are put together. Difficult repairs, such, for example, as straightening crankshafts, axle shafts, reboring cylinders and fitting new pistons, are sent back to the central repair shop from the various temporary repair stations, and here, too, mechanics are schooled for service with the convoys.

Repair Facilities Imperative

The importance of an efficient repair organization cannot be underestimated, for without it the trucks would rapidly go to pieces, the cost of mechanical transport would be disastrous, there would be serious delays to the important work of the quartermasters which might be embarrassing to the troops and the roadsides would be strewn with wrecks.

It was one of the fond hopes of those in charge of the French motor transport before the war that alcohol and benzole would be used in wartime to eke out the supply of gasoline. These hopes have not been realized, however, and gasoline is practically the only fuel employed by the allied forces, although it is believed that the Germans have substitutes.

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Prepared in Trucks—Unprepared in Personnel and Highways

Actual and Potential Supply of Commercial and Military Trucks All That Could Be Desired—Roads Poorly Planned and Paved

WAR finds us prepared in trucks, unprepared in personnel to operate them and sadly unprepared in roads over which they can be run.

There are approximately 250,000 motor trucks of all classes and sizes in use in the United States to-day in all lines of business. Our truck manufacturers are prepared to turn out between 200 and 300 trucks suitable for army use per day. Our Government already has something over 2000 trucks which it purchased for use with the Mexican expeditionary force. These are all available and most are ready for active service on the moment. Yet only 11.3 per cent of our 2,451,660 miles of roads are surfaced and could possibly be used for truck work during every month of the year.

Taking a leaf out of the lesson book of the European nations, it is not the intention of our Government to commandeer indiscriminately the trucks of private users, especially those engaged in manufacturing work of just as vital moment to the nation as it is to have our army recruited to its proper war strength and equipped with everything it needs for the new type of warfare with which we are confronted.

We have no foreign enemy landing on our shores which would require the immediate use of every one of our motor trucks to prevent him from capturing any of our highly-industrial cities along the eastern seaboard. Our conditions are altogether different from those which the foreign nations had to face at the outbreak of war.

For the French there was an enemy swinging toward the gates of Paris at an ever-increasing rate of speed. For the Germans, they needed every one of their trucks to keep the commissary and supply trains advancing at the same rate as their onrushing armies. England, coming in later, needed all her trucks to get her goods to the channel ports and to transport it from the French coast shipping points to the interior bases in France. Russia, without trucks or truck plants before the war, had little use for trucks because there were no roads over which they could run.

It would avail us nothing if we should commandeer trucks now engaged in hauling food products and various forms of manufactured goods upon which the nation as a whole, including its army, must exist. Europe has taught us that preparedness of the non-fighting population at home is just as important as preparedness of the armies afield. Indeed she has taught us that preparedness at home is of far greater consequence because the armies in the field will collapse if they are not supplied with the necessities of subsistence and the wherewithals to fight.

With these lessons staring us in the face it is extremely unlikely that our civilian trucks will be commandeered to any great extent. Especially is this the case when it is considered that certain of our truck makers in the State of Michigan alone could deliver from 200 to 300 trucks per day now and that this output could be increased to meet practically any demand.

The Government has notified larger truck manufacturers to hold themselves in readiness for war operations. At present there are about 1000 trucks in the different Michigan factories which will be immediately available.

Production Schedules

The General Motors Truck Co. has 260 trucks on hand held up by the freight situation and is producing twenty daily. The Republic Motor Truck Co. is turning out seventy-five trucks daily and working 20-hr. shifts. It has 300 trucks stored in Detroit and 2000 stored among dealers. The Commerce company is making fifteen trucks daily with none on hand. It has large stock materials. It belongs to the National Security League and is ready to turn the entire plant and material over at once to the Government.

Packard is making twenty-five trucks daily. It has none on hand unsold but would turn over several hundred awaiting shipment if needed. The Signal company has thirty trucks on hand and is making four trucks daily. The Acason Truck Co. is making three trucks per day. The Federal company is producing fifteen vehicles per day and is engaged in work of a secret nature now. The Denby company is making twenty trucks daily and has 100 on hand. The company has organized employees for daily drills as a company to look after defense of industrial plants.

Packard is doing work of a secret nature now. The company will soon concentrate on aeroplane motors following tests next week.

Lansing plants are under guard and have stocked up with materials and parts in readiness for the Government's call.

All manufacturers have made statements to the Government telling what they can do, and lists of the trained drivers in the different factories are already in the War Department's hands. The Michigan State Auto School has turned its list of 4000 graduates with their present addresses over to the Government and these will serve as drivers.

Cars have been donated by Chalmers, Dodge, Packard, Studebaker, Hupp and Maxwell for recruiting purposes, and recruiting is being done at automobile factories under the auspices of the Women's Volunteer Committee.

The Chicago Pneumatic Tool Co. can furnish 1½ and 2-ton trucks to the Government on short notice. That company has been in the munition business for over a year. Several factories that desire to have their names withheld are situated among the strong German element. In these stringent measures are being taken to guard against tampering. One of the larger factories has installed a lighting system on the outside of its factory, strengthened its force of watchmen and organized a detective bureau from its employees.

Wisconsin Makers Busy

The Four-Wheel Drive Auto Co. is now building thirty-seven trucks per week for the Government and is arranging for increased output to meet probable increased Government demand. The concern has promised the Government to produce 200 trucks per month if called upon. The Wisconsin Motor Mfg. Co. is now furnishing many motors for trucks to truck builders who are working on Government orders. Aviation engines are now being turned out, and the production can be increased to one a day on demand.

But if these preparations should fall short in producing the required numbers of trucks in sufficient time to meet the most stringent needs, we still have the 250,000-odd trucks now in service to fall back upon. While we know that most of our trucks are engaged in work in the great industrial section of the country stretching from the shores of New England westward through portions of New York, New Jersey, Maryland, Pennsylvania, Ohio, Indiana, Michigan, Illinois, Missouri, Iowa, Wisconsin and Minnesota and in a narrow belt along the Pacific coast, including the cities of Sacramento, San Francisco and Los Angeles, it is unfortunate that we do not know just how many trucks are in each State and of what capacities they are.

That this sad state of affairs exists is due to the fact that less than half of the

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States employ a separate registration classification for commercial vehicles and that many of these do not require that the capacity of each vehicle be stated, so that in emergencies such as are now liable to face us we could tell at a moment's notice the work best suited to the trucks in any particular locality.

However, there is not an entire lack of knowledge along these lines. For instance, there were approximately 32,000 trucks in use in the six New England States on Jan. 1, 1917; 34,000 in New York State; 3000 in Alabama; 3500 in Georgia; 900 in the District of Columbia; 11,500 in Michigan; 206 in Nevada; 150 in New Mexico; 6500 in Ohio; 11,700 in Pennsylvania; 3000 in Rhode Island; 2000 in South Carolina, and about 4000 in Wisconsin.

As an example of what service these civilian trucks can render in an emergency, the Motor Truck Club of America, a truck owners' organization in New York City, on April 1 supplied twenty large motor trucks with drivers within twelve hours' notice to carry the complete equipment of one of the New York regiments from the armory in New York City to the point of mobilization 65 miles away.

It is in our roads suitable for military purposes that we are sadly lacking, for only 11.3 per cent of all roads are surfaced.

Our greatest area of hard roads is in New England, New York, New Jersey and Pennsylvania and some in California,

	Total Mileage.	Surfaced.	Percentage Surfaced.
Rhode Island....	2,121	1,246	58.8
Massachusetts ..	18,661	8,800	46.6
Indiana	63,370	27,000	42.6
Ohio	86,453	30,920	35.8
New Jersey.....	14,817	4,600	31.0
Vermont	15,082	3,478	23.1
Connecticut	14,061	3,200	22.7
Kentucky	57,916	13,000	22.1
New York.....	80,112	17,500	21.8
California	61,038	13,000	21.3
Oregon	36,819	7,780	21.1
Florida	17,995	3,500	19.4
Tennessee	46,050	8,625	18.7
Wisconsin	75,702	14,050	18.5
Maryland	16,458	2,950	17.9
Georgia	84,770	13,000	15.3
North Carolina..	50,758	6,500	12.8
Washington	42,428	5,460	12.8
New Hampshire.	14,020	1,800	12.8
Illinois	94,141	11,000	11.7
Maine	25,528	3,000	11.7
Michigan	74,089	8,600	11.6
Pennsylvania ...	91,556	9,883	10.8
Alabama	55,446	5,915	10.7
Texas	128,960	12,000	9.3
Louisiana	24,562	2,250	9.1
Virginia	53,388	4,760	8.9
South Carolina...	42,220	3,500	8.3
Missouri	96,124	8,000	8.3
Delaware	3,674	300	8.0
Utah	15,000	1,053	7.0
Minnesota	93,500	5,500	5.9
Mississippi	45,778	2,500	5.5
Colorado	39,661	1,750	4.4
Idaho	23,109	950	4.1
New Mexico	11,873	450	3.8
West Virginia ..	32,024	1,200	3.7
Wyoming	14,381	500	3.5
Arizona	12,075	350	2.9
Arkansas	50,743	154	2.3
Montana	39,204	775	2.0
North Dakota ...	68,000	1,100	1.6
Kansas	111,536	1,250	1.1
Iowa	106,847	1,000	1.0
South Dakota....	96,306	850	.9
Nebraska	80,338	500	.6
Nevada	15,000	75	.5
Oklahoma	107,916	300	.3

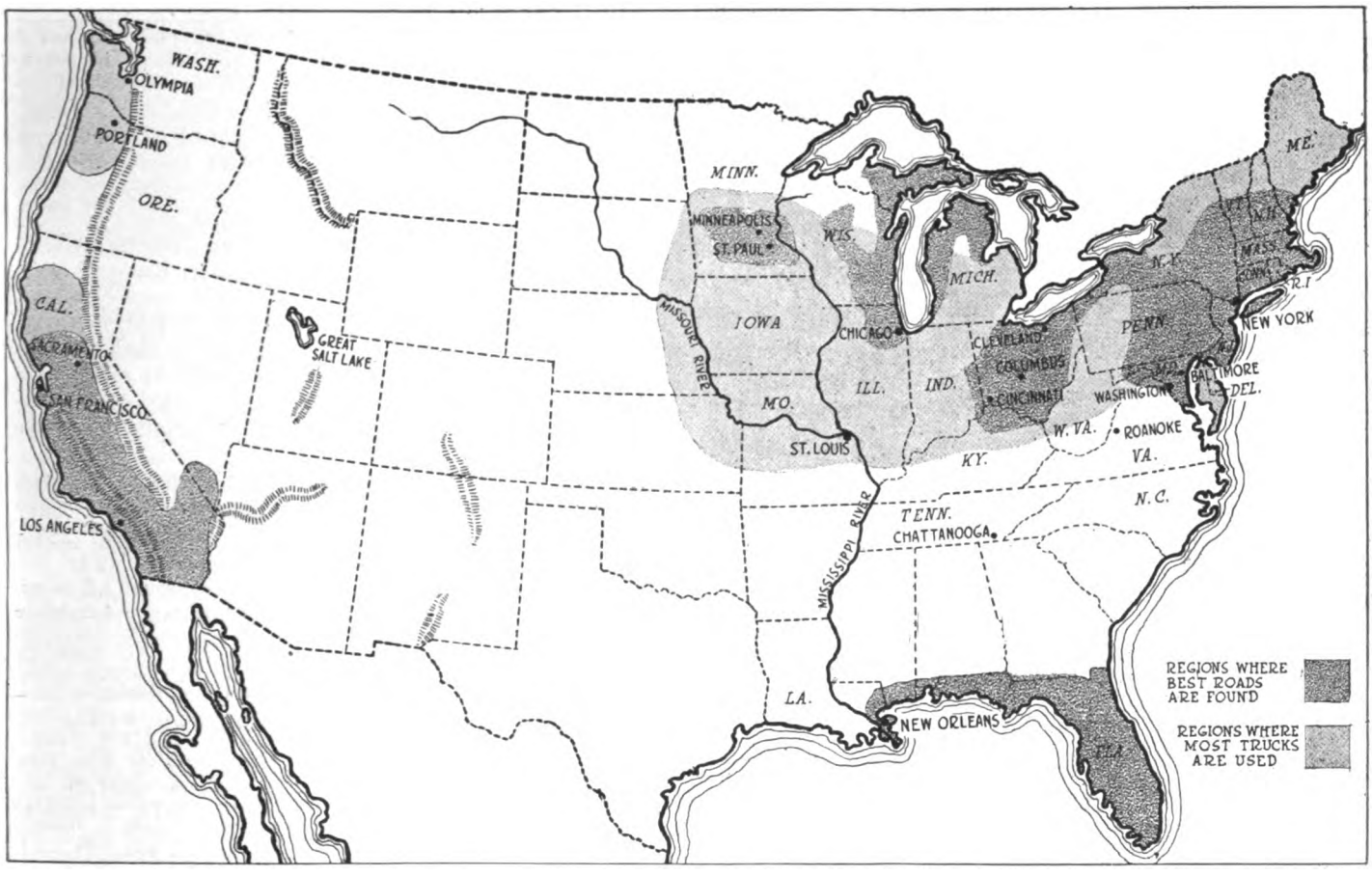
as may be seen in the table in the second column.

The hard-surfaced roads are what may be termed year around highways, over which travel by motor is maintained winter and summer. Through the agricultural sections of the country we find great areas where there is little but graded dirt roads. There are four north and south highways—Dixie, Jackson, Jefferson, and Meridian—that may be said to cross from border to Gulf. These have been much improved over 1 or 2 years ago, but cannot be looked upon as adequate factors from a military standpoint in their present condition.

The value of roads from a strategic standpoint has been ably demonstrated abroad in the last 3 years and the Government, taking heed of what adequate roads mean in the defense of the country, has appropriated a fund of $75,000,000 for federal aid, to be distributed among the several States according to their road mileage. This money is to be turned over to the States, however, only when the State has put up a like amount and formed a highway commission to handle the expenditure of this fund. This is to combat the crazy-quilt system of road building in which roads built on that system have gone nowhere in particular.

Where Roads Do Not Connect

Frequently now we find a road of the highest type drops off abruptly to one that is of the other extreme and when



Map of the United States showing the location of our surfaced roads and the areas in which our motor trucks are employed. It is evident from the areas of good roads and extensive truck use that to a great extent the two go hand in hand. That trucks are not used in great numbers in other districts is unquestionably due to the absence of firm pavements. Good roads are now principally confined to the consuming belt. For efficient industrial and military transportation they must be extended to the great producing regions

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you find a place like that you would be safe in wagering almost always that that point marks the line between two counties. It is to remedy this condition that highway commissions and State supervision of highways are imperative.

With all the hue and cry for preparedness, an adequate road system for military purposes stands above almost any other phase of conducting a war along modern lines.

We have only to look at what maintaining a battery such as is used along the western front in France to understand what kind of roads we need for military use. A fleet of 480 trucks there could handle enough ammunition to feed the big guns for 2½ hours. Down along the Mexican border in Texas roads are few and far between, at least those over which heavy hauling could be done. From the Ohio River south there are two main highways that lead to the Gulf, neither of which are such as would stand the grilling of the thousands of motor trucks that would be necessary to operate were we to be called upon to defend our southern coast and border. These highways are adequate for touring the greater part of the year, but we must build highways that will be adequate for motor trucks and heavy hauling all the year.

What the United States needs to-day is a system of permanent roads throughout the great Mississippi valley, which is the greatest grain producing area in the Western hemisphere.

In this huge valley stretching from the Rocky Mountains eastward across the Missouri, Mississippi, Ohio and Tennessee rivers to the Alleghanies are very few stone highways that are usable roads 12 months in the year for motor trucks. This, the richest agricultural zone of similar size in the civilized world, should be the one section of the country that should be rich in good roads. It is the great section of the country that reeks with bad roads—roads that are not usable 12 months in the year.

Should this great agricultural valley be attacked from the south, across the Mexican frontier, motor trucks would be unprecedented necessities. The roads in this territory would be good for trucks certain months in the year but impassable in others. But war, if waged, goes on for 12 months in the year. It is no respecter of fine weather or dry roads.

This huge Mississippi Valley is comparatively barren of usable roads, roads on which trucks should operate 12 months in the year. Practical preparedness incorporates building of permanent roads through this area just as practical preparedness implies husbanding our farms in this area so that there is no waste of grain. Everything that can be grown in the Mississippi valley is needed.

With a strenuous war it is as imperative to have great permanent roads through this area as to have our harbors at New York, Boston and Baltimore adequately mined and adequately protected by coast defense guns. Roadbuilding cannot and must not be overlooked.

In the fighting in France, and also in Italy, twenty-four motor trucks are needed to transport the ammunition for one large gun. You cannot build railroads right up to your large guns. Between railhead and the line of artillery the trucks must do the work and roads must be furnished for the trucks.

Practical preparedness for the Mississippi valley means permanent roads.

Truck Tonnage Records Totter

New York Stevedore Delivers 578 Tons of Coal in 7 Hours

FIGURES for motor truck tonnage are threatened with eclipse by what Richard Fitzpatrick, contractor, of New York, accomplished with a 5-ton Pierce-Arrow.

In 7 hr. this truck delivered 578 tons of coal.

The run was short, being only about a quarter of a mile return journey. One hundred and fourteen trips were made.

Naturally, for such a phenomenal performance every condition had to favor the truck. Loading and unloading were accomplished in a minimum of time.

The coal was taken from a barge on the river by what is technically known as a digger. Fitzpatrick virtually introduced this kind of coal unloading device to New York, and now operates eight of them. They deliver direct from barge to consumer and do away with the need of a yard. The motor truck completes the delivery.

The digger is located on a boat, so that it can be moved to whatever point it may be desired to effect an unloading.

A large crane, similar to the kind used in dredging work, operates a clam-shell scoop. This goes down into the barge and can take out the coal at the rate of 8 tons in 50 sec. It swings the coal onto the hopper, whence it is dropped into the motor truck. The whole operation can be accomplished in lightning time.

The truck then completes the record of speed by a quick run to the destination, the power dump, controlled from the seat, permitting quick unloading.

The crane is worked by steam power and the whole equipment is so arranged that the digger can go up to the barge and manipulate the coal in and out of any place, sweeping the load over four boats should conditions at a wharf make this necessary.

One digger can in a regular day, without overtime, take 2000 tons off a boat.

In case of the delivery of 578 tons already mentioned one man drove the truck the whole 114 trips, and was so little fatigued that he piloted it for other work in the same evening.

It is because of results like this that Mr. Fitzpatrick is getting away from horses. Formerly he had 285. Now the number has been reduced to 110 and those that die are not replaced.

"Getting rid of horses will give me 10 years more of life," commented Mr. Fitzpatrick. "They were a constant source of racking worry. Something was always going wrong. They got sick, collapsed or died when you wanted them most. Drivers were not reliable. We had to take any kind we could get in a pinch. Hot weather or snow put the animals down and out.

"With the trucks we have a comfortable, scientific delivery. We figure on jobs that we would not tackle with horses. We go to places beyond horses and thus get profitable new business. Brooklyn and Staten Island are easy. In frequent trips on a rush job we once in 11 hr. covered 164 miles on a job at Flushing. It is a joke to consider horses ever doing anything like that."

The Fitzpatrick installation consists of four 5-ton Pierce-Arrows. They are used for the hauling of sand, gravel and stone, and are also let out to the city for the removal of snow. Their all-around consistency is highly praised by Mr. Fitzpatrick.

Save Money
Make Money

See Pages 26 and 27

Among the New Books

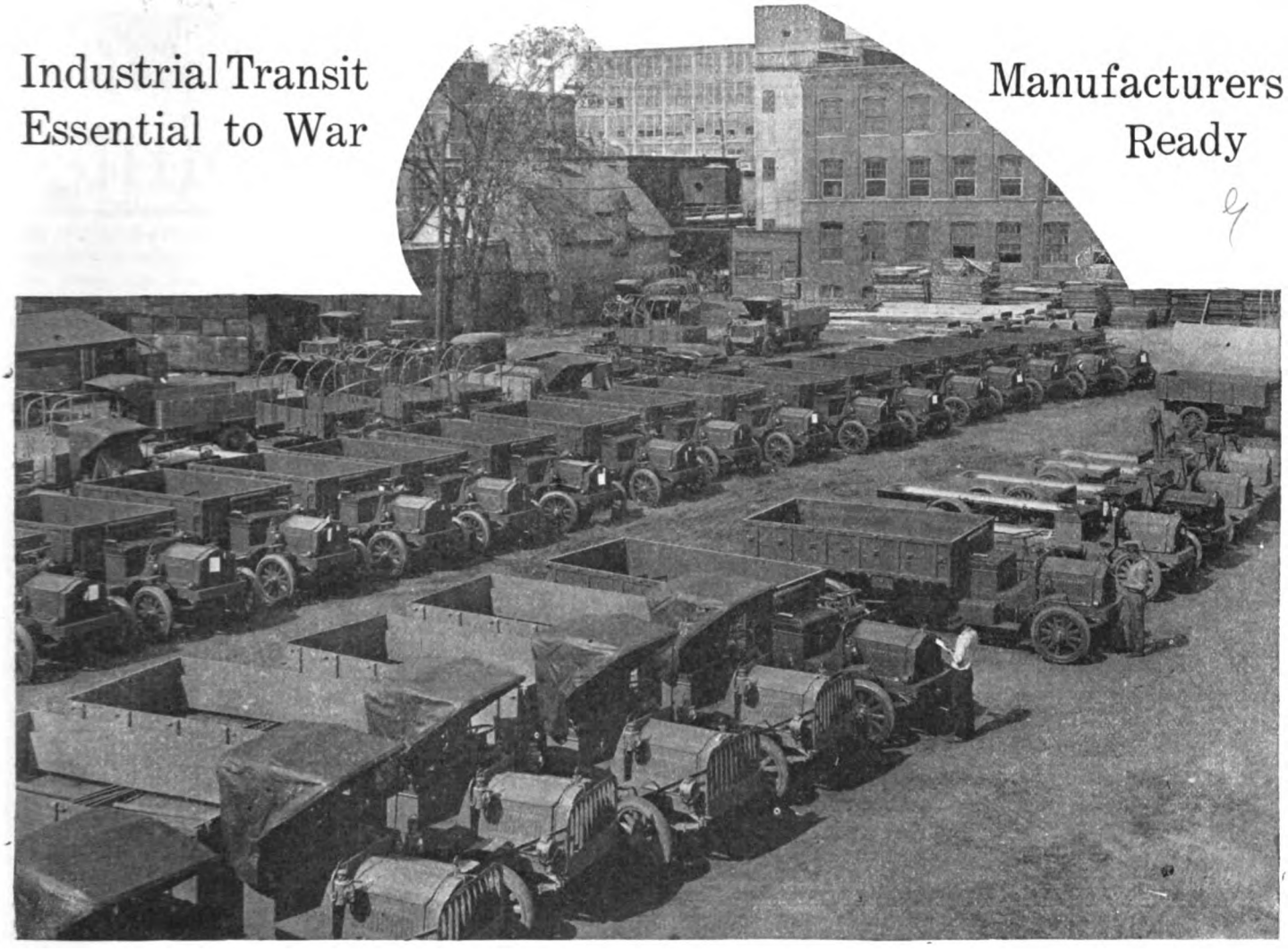
"Engineering Mathematics," by Walter E. Wynne and William Spraragen, is a handy means of reference to theoretical and applied mathematics used in engineering. It is intended for the use of practical engineers and students in engineering schools and colleges. There is a brief introduction to the book by Ernst J. Berg, Sc. D., professor of electrical engineering in Union College and consulting engineer of the General Electric Co., Schenectady, N. Y. The book contains 113 illustrations and is published by D. Van Nostrand Co., New York.

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Army Not Likely to Commandeer Trucks

Industrial Transit Essential to War

Manufacturers Ready



HOW THE FACTORIES RESPONDED TO THE CALL FOR WAR TRUCKS AT THE RECENT DISTURBANCE IN MEXICO

A scene outside the Packard plant in Detroit, showing gray trucks for the Allies and olive ones for our own army getting the finishing touches before shipment. In our year of preparedness before sending expeditions over the sea duplication of this performance will avoid commandeering. Despite war orders, motor truck plants have continued to fill the commercial demand

WHOLESALE confiscation of motor trucks by the U. S. Army is not an imminent likelihood, first, because there is no such necessity for it as faced the European nations, and second, because the army is not in a position to do so. In fighting this war, we are going to proceed slowly at first, so that when we do put armies in the field they will be unhampered by the flaws in makeshift preparations which were occasioned by the frantic haste with which the Allies had to prepare. The mistakes which Europe has made will guide us in our intensive preparations; and unlike our allies, we are fortunately amply supplied with all that they lacked in raw material, machinery and skilled labor.

To-day a war is waged by a nation—not merely by an army and navy—and any weakening of the industrial life of the nation reacts immediately on the fighting forces. That is why the individual owner of trucks need have no fear of a military officer commandeering his rolling stock this week or next month, thus paralyzing his trade and ruining his business. There might be an exception in the case of those who deal in luxuries, but as a rule these do not use trucks of the type the army desires.

When France met Von Kluck before Paris every motor vehicle that would run was pressed into service; but no invading force is going to threaten our metropolis. We may have to send an expeditionary force to our southern border and we may send armies to Europe; but domestic life will go on in its normal channels, except that we will all be expected to work a little harder, for most of us will be a little short-handed. We will waste a little less and produce a great deal more. There will be such a call for road transportation as we have never experienced, but it will be mostly industrial and commercial.

The motor vehicle industry of America is prepared as no industry in this country has ever been prepared before, to deliver to the army just the vehicles which it requires and in numbers sufficient for its gradually growing needs. Certainly the United States will not procure trucks faster than it accumulates work for them to do or men to operate them.

Fortunately, or unfortunately—most of us incline to the latter belief—we have no motor truck subsidy. If we had, the government would call in the subsidized vehicles first, as its property. Their owners would have expected the event, so that it would not be a calamity. They would be already manned with drivers trained for military duty. As we have not, to go out and seize commercial vehicles would be little short of folly, for their erstwhile owners would be forced to take the confiscation money and immediately buy new trucks to replace them, when the government itself could just as easily buy the new trucks without upsetting the commercial life of the nation. It would still be under the necessity of recruiting operators for them.

Such commandeering of vehicles as might be expected will be in the form of commandeering of plants for the swift manufacture of standard war chassis and

Continued on page 17)

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Sensible *vs.* Senseless Registrations

WAR today finds us with upward of 250,000 trucks of all kinds in use, yet with no one who can say accurately just where these trucks are or of what capacity. To be sure, the Council of National Defense has records of the number of trucks in use by manufacturers, yet the number of trucks employed by non-manufacturers, such as wholesalers, handlers of food products, retailers and haulage contractors, far outnumbers those utilized by manufacturers.

Who has these 250,000-odd commercial vehicles? Where are they used? Of what carrying capacity are they, and of what good are they to the government? What work can they best perform and how can they be secured in the minimum of time to meet an emergency? These are the questions which a sensible system of registration should be able to answer, but which our present scheme, if it may be called such, does not accomplish.

What we need to-day is a uniform system for the registration of motor trucks which will enable the government, in case of an emergency, to put its finger on every last commercial vehicle in use, and to tell at a moment's notice the military work which each truck is best capable of doing.

It is fortunate that we do not to-day find ourselves in the position of France at the outbreak of the European war, with the best-organized army in the world crashing through Belgium in a well-planned onslaught against the gates of Paris. She needed every one of her trucks, and needed them badly. She got them, too, because her registration and subsidy plan enabled her to tell where every truck was and what work it could best do.

It is fortunate that there is no immediate necessity for commandeering any appreciable number of our civilian trucks; that our truck manufacturers can supply 600 trucks per day, and even more if required, and that we do not have to demoralize our industrial transportation to meet the needs of the military.

It is indeed fortunate that all these conditions exist, for if, like France, we suddenly had to mobilize a fleet of several thousand motor trucks to transport troops, ammunition and supplies to some point on our coast not touched by railroads, in order to prevent an invading army from getting a firm foothold, we would all be at sea. We don't know exactly where our trucks are; we don't know what they are best fitted to carry or how much, and we don't know how fast they can run in order to be placed in proper convoy formation.

All these things we should know, and at a moment's notice.

It would seem that the first step necessary to make such information available would be a Federal statute requiring that every state register separately the commercial vehicles in use within its confines. Less than half of our forty-eight states and the District of Columbia at the present time register trucks and passenger cars separately.

The information which this statute should require the states to list should be much more complete than is now furnished, and should include, besides the name, address and business of the owner, the make of truck, the year of manufacture, the load capacity in tons, the wheelbase, the chassis and engine numbers; the type of wheels fitted, if of wood or steel, and a list of special equipment, such as winch, trailer drawbar, towing hooks, special gearset; differential locks, especially large wheels, extra large capacity fuel tanks and the like.

It should be made obligatory on the owner filling out the blank giving such information to swear to its correctness and completeness in order that the careless or indifferent owner might not find it easy to shirk his responsibility.

The statute which would require each state to obtain the information outlined above should also make it compulsory for each state to duplicate such information on cards, to be sent to the proper Federal department in Washington in charge of motor transportation within a certain period after each registration is taken out. In Washington such information should be properly filed, indexed and kept up to date from month to month so that in case of a national emergency requiring the use of our civilian trucks all information regarding them would be immediately available.

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Motor Transport Reserve Committee Organized in Washington

Users' and Manufacturers' Bodies Co-operate to Provide Truck Trains Quickly, if Needed

NEW YORK, April 10—The mobilization of motor trucks and automobiles for army transportation work has taken definite shape by the appointment of the motor transport reserve committee which has been created by the Council of National Defense at Washington. Alfred Reeves, general manager of the National Automobile Chamber of Commerce, is chairman of the committee, and associated with him are three other men prominent in the automobile industry, Roderick Stephens, president of the Motor Truck Club of America, and who is also in the coal business in New York City; Coker F. Clarkson, general manager of the Society of Automobile Engineers, and A. G. Batchelder, chairman of the executive committee of the American Automobile Assn.

This Motor Transport Reserve Committee met in Washington, D. C., last week with Secretary of War Baker, and also with Col. Baker, who is head of the transportation department of the U. S. Army. As a result of this conference a rather clear outline of the work of the committee was arranged. A committee is preparing a definite plan for the mobilization of motor trucks and automobiles for emergency needs in any part of the country. It is also preparing a definite plan for organization of available drivers and mechanics needed for such a mobilization. The necessary layout of suitable highways for transportation purposes comes under the work of the committee.

It is expected that within 10 days good progress will be made and another meeting of the committee held in Washington. The N. A. C. C. took the initiative in this work by volunteering not only to do the work but to share the expense of it as well. It is expected that a complete census of motor trucks throughout the country will be made. The committee plans to schedule all available truck fleets of private owners on a basis that perhaps 10 per cent of their trucks should be held available for call on 2 hr. notice; that 20 per cent would be held available for call on 1 day or perhaps 2 days' notice, etc. In this way the committee hopes to know exactly what trucks can be counted upon for emergency needs in any section of the country.

Secretary of War Baker, it is understood, expressed gratification, following a recent conference with the moving spirits in the Motor Transport Committee, and the Motor Trucks Standards Conference Committee, as a result of the potential aid to be found in the organized motor forces of the country. Among those who participated in this conference with the Secretary of War were Howard E. Coffin, chairman of the Committee on Transportation and Communication of the Advisory Commission of the Council; Coker F. Clarkson, general manager, the Society of Automobile Engineers; A. C. Batchelder, general manager the American Automobile Association; Col. Chauncey M. Baker of the Quartermaster's Corps of the Army; Roy D. Chapin, president of the Hudson Motor Car Company.

A complete census of the motor trucks suitable for army service and drivers capable of handling these trucks is being made by the recently appointed mobilization committee of the Chicago Automobile Trade Assn., with a view to furnishing army headquarters with a list of trucks which owners will offer for service and a list of drivers who offer to enlist to drive these trucks.

The census is being drafted through the dealers. Each dealer lists his truck purchasers, and if these express a willingness to relinquish their trucks for government service the complete specifications of the trucks are listed in the report which will be given to the army. Although the present census has to do with trucks only, a survey of the passenger cars will be made if conditions seem to warrant it. L. Markle, Studebaker distributor, is chairman of the mobilization committee.

At the request of Col. J. M. Carson, Jr., Quartermaster's Department of the East, United States Army, the Motor Truck Club of America, Inc., has canvassed its members by letter to determine how many trucks they could supply for military work in the Greater New York district and at what prices such trucks could be hired. The daily rates suggested by the club for trucks of the following capacities are given in the table below:

1 to 1½-ton, at the rate of $15 per day.
2 to 2½-ton, at the rate of $18 per day.
3 to 3½-ton, at the rate of $20 per day.
4 to 4½-ton, at the rate of $22 per day.
5-ton, at the rate of $25 per day.
6 to 7-ton, at the rate of $30 per day.

Many of the members have agreed to place varying numbers of their trucks at the service of the quartermaster for immediate military needs at prices closely approximating those quoted above in most instances, and such information has already been forwarded to Colonel Carson.

OWNERS RALLY FOR WAR SERVICE

WASHINGTON, April 9—A plan is being worked out by the American Automobile Assn., with the encouragement of the War College, for voluntary enlistment of motor car and motor truck owners for short periods, the understanding being that their services are offered for emergencies.

However, the War Department, while taking the position that it can assume no obligations of any character, is frank to express its approval of the scheme provided it is in harmony with the organization plans already worked out by the army officers. It also was stated at the War Department that such co-operation with the government on the part of car and truck owners will not be under the direct auspices of the department.

War Department officials do not anticipate that it will become necessary to commandeer private cars for war use, as the supply of both cars and trucks suitable for such work is more than adequate at present.

Motor clubs throughout the country are playing prominent parts in organizing the car and truck resources of the country to meet war requirements. In addition to the activities mentioned last week, the Automobile Club of Maryland is conducting a volunteer census of its members, securing information regarding their vehicles, etc. Similar work is being carried on in Massachusetts, Maine and numerous other states. In Indiana the Hoosier Motor Club has formulated a plan for organizing automobilists into a motor reserve to act as an auxiliary of the State National Guard. Plans of the same sort are under way in New York, California and other states.

Enlistment Guide

FOR MECHANICS, TRUCKMASTERS, AVIATORS, DRIVERS, ETC., WHO WISH TO ENLIST IN U. S. ARMY FOR SPECIAL WORK

Should Apply to Quartermaster Officers' Reserve Corps

HEADQUARTERS
Governor's Island, N. Y. City

States

New York	District of Columbia
New Jersey	West Virginia
Pennsylvania	Virginia
Delaware	Canal Zone
Maryland	Porto Rico

Boston, Mass.

All New England States

Charleston, S. C.

North Carolina	Tennessee
South Carolina	Mississippi
Georgia	Coast Defenses at
Alabama	New Orleans
Florida	Galveston

Chicago, Ill.

Ohio	North Dakota
Kentucky	South Dakota
Michigan	Missouri
Indiana	Iowa
Illinois	Kansas
Wisconsin	Nebraska
Minnesota	Wyoming
Colorado	

Fort Sam Houston, Tex.

Texas	Oklahoma
Louisiana	New Mexico
Arkansas	Arizona

San Francisco, Cal.

Washington	California
Oregon	Nevada
Idaho	Utah
Montana	Alaska

Officer Enlistments

Aviators, aeroplane designers, motor designers, inspectors, etc., wishing to enlist as officers should apply to the Quartermaster General at Washington, D. C., who will direct them to their respective quartermasters' offices, after passing on their applications. Aviators will be enlisted in the Aviation Section of the Enlisted Reserve Corps in the grade of a corporal or sergeant. Engineers will be enlisted in the Engineers' Corps.

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Revise U. S. War Truck Specifications

Many Small Changes—Not as Stringent on Details

NEW YORK, April 10—The work of the War Department committee on revising specifications for military trucks, in which much assistance has been given by the S. A. E., is completed for this year, and the full specifications are now being printed for circulation. In general the specifications are similar to those for the 1½-ton truck issued a little less than a year ago, but there have been a good many detail changes and the specifications as a whole are less stringent on matters of petty detail.

The following are the principal features of the new truck:

Four-cylinder engine, 312 cu. in. piston displacement.

Poppet valves only.

Pressure lubrication.

Disk clutch.

Four-speed gearset with low gear ratio of at least 40 to 1.

Preferably worm final drive.

Highest possible clearance, minimum at center about 14 in.

Some form of locking differential acting automatically to prevent wheel spinning.

Electric lighting equipment.

Radiator about twice the size normally used.

36 by 4-in. tires, must be demountable.

Interchangeability of radiators, gasoline tanks and body attaching devices are points and the qualities of materials that must be used are specified, most strongly for such vital parts as the springs.

It is clearly understood that the War Department means to get these trucks in accordance with specification, and not, as happened last year, be forced to take the nearest commercial product.

It was announced when the committee first began sitting that the scheme was to revise specifications annually so as to enable advantage to be taken of increasing knowledge and improvement. It is now again stated that revision in 1918 will certainly be made, though it is unlikely that it will be a complete recast. It is the intention of the War Department to order enough trucks to the present specifications to make it worth the while of manufacturers to arrange for their production, even though they cannot use more than a part of units which now go into the standard machine.

PACKARD ARMY TRUCKS BUILDING

DETROIT, April 10—*Special Telegram*—Packard is already delivering trucks to the government, but is still taking care of its normal truck business.

ARMY WILL BE BIG TRUCK BUYER

WASHINGTON, April 9—The declaration by Congress of a state of war with Germany is to be followed by the purchase in large numbers of cars and trucks, especially the latter, and while the details looking to such purchases have been worked out, no actual contracts will be made until the Quartermasters' Corps knows to what extent the army now in the process of being built up must be equipped. The plan is to equip the various divisions with trucks as rapidly as they are properly mobilized.

At present the army has 2600 trucks. This number is sufficient to take care of the needs of the army at present. However, as soon as the regular forces and the national guard units are recruited up to full strength, which will mean close to 800,000 men, and the problems of transportation for such a large force have to be met, the purchase of trucks will begin.

$100,000 WAR TRUCK REPAIRSHOP PLANNED

WASHINGTON, April 9—A great automobile plant will be established in connection with the Jeffersonville, Ind., quartermaster's depot if Congress grants an appropriation of $100,000 which has been requested. The money is needed for additions to the present plant, ample land being available. The plant is intended to take care of the great number of motor trucks which the army will need, building of bodies and, if necessary, of complete trucks. It is also to be used for the repair of trucks sent in from the field.

S. A. E. MEMBERS CARD-INDEXED

NEW YORK, April 9—Over 1500 members of the Society of Automobile Engineers have replied to the questionnaire mailed March 30 requesting information necessary for the classification of members to insure maximum efficiency in co-operation with the United States Government. This system of card indexing is part of a campaign to locate each man where he will be of most value in the general scheme of military organization.

SPRINGFIELD ABSORBS TWO PLANTS

NEW YORK, April 11—The Springfield Motors Co. has completed arrangements for merging the John Davenport Foundry Co., Stamford, Conn., and the Amco Motor Co., Norwalk, Conn., and will use the plants of these companies for the manufacture of motor car, motor truck and aeroplane engines.

There have been some changes in the Springfield organization, which now has the following officers and directors: John J. Cone, president, is a partner in the engineering firm of the Robert W. Hutton Co.; E. C. Morse, vice-president, is vice-president and general manager of the Chalmers Motor Co.; W. H. Hoople, vice-president, is president of the American Motors Corp. and also of the Interstate Electric Co.; Gerard Roberts, secretary and treasurer, is an attorney. Directors in addition to the above are: E. S. Kelly, formerly president of the Kelly Motor Truck Co.; Louis Chevrolet, and E. J. Shriber.

Coming Events

April 17.....Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.

April 18.....New York City, Monthly Meeting of the Motor Truck Club of America at Noontime.

April 18.....Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.

April 19.....New York City, Monthly Meeting, Metropolitan Section S. A. E. Automobile Club, 247 West Fifty-fourth Street.

Swetland Pledges Aid to Government

Business Publications to Help in Any Way Possible

NEW YORK CITY, April 10—Pledging the support of the great business magazine organization of which he is the head, H. M. Swetland, president of the United Publishers Corp., 243 West Thirty-ninth Street, has gone on record as being anxious to assist the government in whatever way possible, as expressed in the following letter:

EXECUTIVE OFFICES
UNITED PUBLISHERS CORPORATION, 243 WEST THIRTY-NINTH STREET
NEW YORK

April 10, 1917.

Mr. Grosvenor B. Clarkson,
Secretary of The Council of National Defense,
Washington.

Dear Sir:

After consultation with our board of directors, the United Publishers Corp. has decided to offer to all departments of the United States Government the absolute co-operation of our industrial publications covering many leading industries of this country, both in the matter of editorial co-operation and the free use of advertising space, for the purpose of assisting the Government in the mobilization of our industries, publicity in methods of finance and the promotion of any project undertaken by the Government during the present condition of war.

We cover the iron, steel and machinery industries through the Iron Age and Hardware Age, New York.

The automobile and motor truck industry through the
COMMERCIAL VEHICLE.....New York
Automobile .....New York
Motor Age .....Chicago
Motor World .....New York

The shoe industry through the Boot & Shoe Recorder of Boston.

The building industry through the
American Architect .....New York
Building Age .....New York
Metal Worker .....New York

The dry goods field through the
Dry Goods Economist.....New York
Dry Goods Reporter.....Chicago
Drygoodsman .....St. Louis
Pacific Coast Merchant, San Francisco

We shall seek to interest the active co-operation of these important business interests in their local centers, and shall hope to especially assist in placing the bond issue without expense to the Government.

In any of these matters your commands will receive our prompt and immediate attention.

Yours very truly,
H. M. SWETLAND,
President.

CLYDE, OHIO, April 11—The Krebs Commercial Car Co. has increased its capital from $100,000 to $500,000. Eastern capital is interested. The same officers are retained.

MORMONS USE 1559 TRUCKS

SALT LAKE CITY, April 9—Motor registrations in Utah, as reported by the Secretary of State on March 31, total 1559 motor trucks.

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Prices of Four Truck Makes Increased

Denby, Hurlburt, Bessemer and D-E Cost Trifle More

DETROIT, April 2—Denby trucks, made by the Denby Motor Truck Co., this city, have been raised in price according to the tabulation given below, in which the former prices are those as published in the specifications of THE COMMERCIAL VEHICLE of November 1, 1916. The 1-tonner is a new model.

	New Price	Former Price
1-ton	$1,275	$1,135
1½-ton	1,775	1,575
2½-ton	2,150	2,090

HURLBURT TRUCKS DEARER

NEW YORK, April 9—Price increases of from $100 to $500 have been made on the five sizes of trucks produced by the Hurlburt Motor Truck Co., New York City, as follows:

	Old Price	New Price
1½-ton	$2,250	$2,350
2-ton	3,000	3,300
3½-ton	3,500	3,850
5-ton	4,250	4,600
7-ton	5,000	5,500

SOME BESSEMER PRICES INCREASED

NEW YORK CITY, April 14—Prices of Bessemer trucks, made by the Bessemer Motor Truck Co., Grove City, Pa., have been increased on two models and continued at the same figure on the remaining two models of the line. The old and new prices of all models are as follows:

	Old Price	New Price
1-ton	$1,075	$1,250
2-ton	2,200	2,200
3½-ton	3,100	3,100
5-ton	3,600	4,000

D-E PRICES INCREASED

NEW YORK CITY, April 7—The prices of D-E trucks made by the Day-Elder Motor Co. of Newark, N. J., have been increased as follows:

	New Price	Old Price
1-ton	$1,375	$1,250
1½-ton	1,600	1,500
2½-ton	2,100	2,000

NEW DUPLEX FACTORY

LANSING, MICH., April 11—The Duplex Truck Co. will construct a new factory, 600 by 70, two stories. This will be completed by Sept. 1 and ready for manufacturing.

STEGEMAN DOUBLES CAPITAL

MILWAUKEE, WIS., April 9—The Stegeman Motor Car Co. has increased its capital from $100,000 to $200,000 and has also made changes in its personnel. L. G. Schertl is the new secretary-treasurer and sales manager, with Oscar Stegeman remaining president and guiding head, and F. W. Apel has been appointed assistant sales manager to take care of the increasing business. The directors include: Oscar Stegeman, president; F. H. Parker, vice-president; L. G. Schertl, secretary-treasurer; Frederick Gettelman, Faustin Prinz, Adam Mayer and C. P. Bossart.

Its Boston dealers took forty-seven trucks during the past 90 days. Its sales in January, February and March surpassed the entire sales of 1916. Its growth is at the rate of 300 to 400 per cent.

The company is in its new office building. The factory addition will be completed within the next 30 days.

RACINE IS REVIVED PIGGINS

RACINE, WIS., April 11—The Racine Motor Truck Co., soon to be capitalized at $500,000, with a paid-up stock amounting to $250,000, has established a plant here, manufacturing having already been started at the plant formerly used by the Piggins Motor Truck Co.

The temporary officers of the concern are Ira Miller, of Los Angeles, president; Charles Piggins, Racine, treasurer, and F. H. Piggins, secretary. The truck will be known as the Reliance, in five models, ¾, 1, 2, 3 and 5 tons.

When the plant is well under way thirty-five mechanics will be employed. It is also stated that the company will be producing within a month. A new plant is to be built, stated to be 30 by 60, of steel and concrete construction, one floor.

The Reliance truck will be built on the same lines as the Piggins truck. The 1-tonner will sell for $995.

TO DISCUSS ELECTRIC VEHICLES

NEW YORK, April 9—A conference of manufacturers of electric passenger and commercial vehicles, electric industrial trucks, batteries, tires and accessories will be held April 19 at 1:30 p. m. at the headquarters of the National Electric Light Assn., in the Engineering Societies' Building. This meeting is called for the purpose of working out a plan of definite co-operation between manufacturers and central stations with a view to promoting a more general use of electric vehicles. Tentative program includes the following features:

1—Analysis of the present electric vehicle situation and the purposes of this Conference by Chairman F. S. Mansfield.
2—A paper by C. D. Fairgreave, Anderson Electric Car Co., on Advertising and Publicity.
3—A paper on getting local distribution, by P. D. Wagoner, General Vehicle Co.
4—The charging problem in vehicle selling, by C. A. Street, Walker Vehicle Co.
5—The Electric Industrial Truck, author not yet determined.
6—Paper by E. P. Chalfant, Anderson Electric Car Co., on Co-operation.

Better Truck Repairs
See Pages 26 and 27

Gotham Motor Buses Earn 1330%

Great Profit Due to Saving in Operating Costs

NEW YORK, April 11—The Fifth Avenue Coach Co. for the 6 months ended Dec. 31, 1916, showed a total income of $332,709, equal to 665.41 per cent on the $50,000 capital stock. This is equal to 1330.82 per cent for the year. Gross earnings for the ½-year period were $1,107,159, compared with $1,669,726 for the 12 months ending June 30, 1916. Operating expenses totaled $788,155, leaving a profit on operations of $319,-004, as compared with $494,200 for the whole of 1916.

U. S. MAY TAKE OVER GOODRICH

AKRON, April 9.—An order received by the B. F. Goodrich Rubber Co. to enlist 1000 experienced employees for a naval reserve to operate the plant in case war is declared with Germany is regarded as confirmation of the report that the plant is to be taken over by the Federal Government. The plant was offered the government some time ago. The firm is making dirigible balloons for the government.

GREEN TO MANAGE TANKS

NEW YORK, April 9 — George Allen Green, chief engineer and superintendent of the Fifth Avenue Coach Co., which operates upward of 200 motor buses on the streets of New York, has sailed for France to take the captaincy of a corps of armored tanks on the Somme front. Mr. Green was offered the position of captain by the British government, the appointment undoubtedly coming because of his thorough knowledge of Knight sleeve-valve motors, which are used in the British tanks. As engineer of the Fifth Avenue Coach Co. Mr. Green has had a wide experience with this type of motor, his company having purchased 250 Moline-Knight motors for use in Fifth Avenue buses. Previous to assuming his present position with the Fifth Avenue company Mr. Green was superintendent of the London General Omnibus Co., which operated buses on the streets of London. For 19 years he has been acting in various engineering capacities in connection with transportation matters, and of these 14 years have had to do with matters of design, construction and operation of gas-propelled vehicles. Since coming with the Fifth Avenue Coach Co. Mr. Green has reduced the cost per mile of operation more than 100 per cent. One of his recent activities was that of developing a complete snow removal system for the Fifth Avenue Coach Co., by means of which it removed snow from over 30 miles of New York streets on which the buses operate without interfering with their regular schedule.

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REPUBLICS DELIVERED OVERLAND

GRAND RAPIDS, MICH., April 11 — Eleven Republic trucks, driven overland from the Alma factory to this city, were delivered recently. Each truck assisted in conveying a $2,500 stock of parts.

FIFTY FEDERALS FOR OIL COMPANY

NEW YORK CITY, April 4—Fifty Federal trucks have recently been purchased by the Atlantic Refining Co., Philadelphia, Pa., and will be used by that concern in its distribution of gasoline throughout the United States.

Complete Hudson Vehicle Tunnel Plans

Mile-Long Bore Will Serve for 2 Million Vehicles

NEWARK, N. J., April 6—Results in detail of the investigation of the Hudson River vehicular tunnel project by the Public Service Corp. officials and its outside experts have been published. A single tube has been proposed, to be built now either as a free highway, government constructed, or as a toll tube constructed by the Public Service Corp. through bond issues. The estimated cost is $10,618,000.

The termini are Twelfth Street, Jersey City, and Canal Street, New York. If begun this year it would be completed by 1920.

The length of the tunnel under the river would be 5495 ft. The interior space, according to plans, would be 26 ft. wide, 13 ft. high. The roadway proper would be 17 ft. between curbs. The grades of the approaches, maximum, would be 3.85 per cent on the Jersey side and 4.55 per cent on the New York side.

The tunnel will be ventilated by drawing in fresh air and expelling vitiated air. The practicability of the method of ventilating the proposed tunnel was confirmed by a series of experiments made in this city.

The estimated traffic through the tunnel in 1920 will be not less than 2,000,000 vehicles, 60 per cent of which will be motor-driven. If built by the Public Service Corp. the toll will be 35 cents, which means that probably more than 60 per cent will be motor-driven, as it is most probable that drivers of horse vehicles will use the ferries at the same or cheaper prices rather than taking the long haul under the river.

The probable effect of a vehicular tunnel on the lighterage system would be first to lessen the congestion; second, to speed up shipments of freight, etc., to ships in Hoboken, and third, to reduce freight rates by eliminating lighterage charges.

Drastic Truck Legislation Faced By California Operators

Would Tax Buses $25 Per Passenger Seat—No Trucks to Be Larger Than 5 Tons in Capacity

LOS ANGELES, CAL., April 11—Commercial vehicles seem to be the target of California legislators in their desire to raise money for the state. No fewer than four bills have been introduced at Sacramento having for their object the taxing of commercial vehicles. California has been a fertile field for this class of legislation, and the present bills have aroused the ire of the truck dealers and users. All of the bills provide for additional fees, the present fees remaining in force. Senator Rominger's first bill, No. 365, would impose an additional license tax upon motor vehicles engaged in or used in the business of carrying passengers for compensation over any public highway in this state. His plan is to tax each of such vehicles $25 per annum for each seat of its seating capacity. Experts have estimated that the owner of each such motor vehicle will have to pay $1,250 per annum in taxes of various kinds if this Rominger bill goes on the statute books.

Senator Rominger's other bill would tax commercial vehicles operated as common carriers of goods for hire upon the public highways of this state. This measure would tax on a capacity basis. A 1-tonner or less would pay $50 per annum; from 1 to 3 tons, $150; from 3 to 5 tons, $250, and over 5 tons, $350, all this in addition to the regular state license, weight, and state and county property taxes. On this basis the owner of a 5-tonner so engaged would pay from $650 to $700 per annum.

Senator Canepa has introduced a bill regulating the width of tires, the width and length of commercial vehicles, providing for licenses thereon; regulating the weight of loads and the speed limit.

According to the Canepa bill no load exceeding 10,000 lb. shall be carried, except in the case of a single article weighing more than 10,000 lb. The speed would be limited to 9 m.p.h., and to 4 m.p.h. when the truck should develop a defective tire.

Don't Miss—
Pages 26 and 27
This Issue

CANADIANS PROTEST BRIDGE TOLLS

MONTREAL, QUEBEC, April 9—The Montreal Automobile Trade Assn. is making a strong protest against the proposed increased charges for tolls on Victoria Bridge. As this bridge is the only outlet to and from Eastern Canada for American automobile tourists and truck owners, the increased toll will seriously affect the residents of the South Shore.

The very heavy proposed tax on trucks will prevent the merchants making regular deliveries, as the cost of 80 cents toll for a light delivery truck will make them prohibitive.

150 S. A. E. APPLICATIONS PEND

NEW YORK, April 9—Over 150 applications for membership have been received at the headquarters of the Society of Automobile Engineers since March 14. There are now nearly 100 applications ready for consideration at the next meeting of the Council, which is scheduled for April 16 and 17 at the Hotel Congress, Chicago.

Applications for membership are coming in steadily at both the Detroit office of the membership committee and the New York headquarters of the society, indicating that the S. A. E. campaign for 2500 new members is getting well under way.

THIRTY-FOUR GARFORD TRACTORS FOR NEW YORK

NEW YORK CITY, April 4—Thirty-four Garford 10-ton tractors have just been purchased by the Street Cleaning Department of this city for use in hauling the various types of trailers in the model street cleaning district of the city, the equipment for which is now entirely motorized.

TRUCKS INK, JERSEY TO BOSTON

BOSTON, April 11—The local situation as regards the supply of paper and ink for the newspapers has become so acute that it has been found necessary to send trucks as far as from Jersey City, N. J., to Boston to take care of the supply. William McCullough, a truckman of Jersey City, was recently called upon to deliver 6 tons of ink to a local daily. McCullough has a fleet of 5- and 6-ton Gramm-Bernstein trucks and used one of these on the order. He made the 250-mile trip without a mishap in 30 hr.

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Army Not Likely to Commandeer Trucks

(*Continued from page* 11)

perhaps enforce temporary hire of commercial vehicles for the transportation of supplies to munitions plants, training camps, arsenals and forts.

Plans are under way by which this latter can be carried out with the minimum hardship to all concerned by creating a register of available vehicles which can be recruited to form a transport reserve on short notice, each train being made up of a small percentage of the vehicles of numbers of owners, rather than the entire fleets of certain ones and none from others.

We are not likely to put as large forces in the field as the European nations and certainly not on such short notice. Our motor truck industry is equipped to manufacture many times the volume of trucks that the combined industries of our Allies ever were. Authorities state that for the first year perhaps, or at least for the first 6 months our efforts will be mainly directed toward speeding up the production of munitions and supplies for the Entente nations, naval co-operation with them and the training of an American army. During this period there will be plenty of time to produce any quantity of military trucks we may need without interfering with the supply of trucks for our Allies or seriously affecting commercial production for our industrial requirements.

This does not mean, of course, that commercial users will enjoy the same freedom in the use of their vehicles as heretofore. Perhaps, temporarily at least, a certain percentage of most large fleets of trucks will be requisitioned to aid in the tremendous amount of transportation which will be required for preparedness and training work.

Inter-city transportation will have a decided revolution before long. The railroads, already seriously embarrassed by their inability to accommodate themselves to the great increase in traffic already realized, will be able to render still less service to general commerce, owing to the preferred demands of the government when active work on preparedness really begins.

Our expanded industries, on the other hand, will require still more transportation service. Motor trucks will logically be the means by which this extra transport service will be rendered.

All indications point to the likelihood of the railroads being relieved from much of their short-haul service. Everything in industry, as far as possible, will have to be concentrated on the work for which it is best fitted. Railways are the best practical means of long-haul transportation overland and if they are allowed to specialize on this class of work their capacity will be enormously increased. It is demonstrated that motor trucks can handle the short-haul traffic more quickly, more safely and in most cases more cheaply than the railways. We will undoubtedly find in addition that it will be necessary in emergencies for motor trucks to undertake long-haul work. We are likely to see shipments of meat for New York, Boston and Philadelphia shipped overland from Chicago, St. Louis, Pittsburgh and Cincinnati by motor truck. Flour will probably be trucked from Minneapolis to Chicago, Milwaukee, St. Louis, Detroit, Cleveland, etc. Cotton may be transported to the Gulf ports from the various ginning mills in the South by motor trucks and trucked from New England ports to the eastern mills, from other Atlantic ports to the powder mills.

It may be that the railways will not be called upon to haul goods for shorter distances than 100 miles. This will place such a burden upon the motor hauling equipment of every line of legitimate commerce that we cannot afford to divert any of the equipment to military service.

Maintenance Hints Worth Money

See Pages 26 and 27

Motor Truck Club Assists in Mobilization

Supplies Trucks to Move Equipment

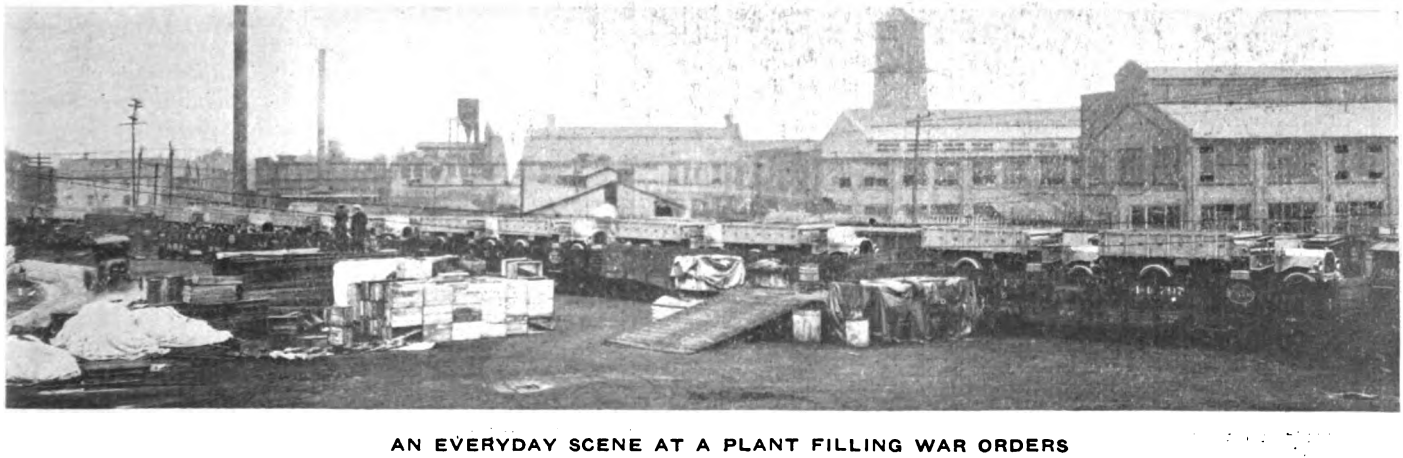
PREPAREDNESS of a decidedly practical nature was exhibited by the Motor Truck Club of America on Sunday, April 1, when a train of twenty civilian motor trucks which it organized and officered transported 110 tons of equipment of the Seventy-first Regiment from New York City to two points up state, one 35 miles and the other 67 miles from the city.

The call for trucks came from Colonel Bates on Saturday morning, March 31, and before midnight twenty trucks, varying from 3 to 5 tons capacity, were backed up to the curb at the Seventy-first Regiment Armory ready to be loaded. They were all loaded with ammunition, food, tents, rifles, camp equipment, etc., by 7.30 a. m. on the following morning, when they were divided into two trains, one of sixteen trucks, which was dispatched to Middletown, N. Y., 67 miles distant, and the other, of four trucks, was sent to Harmon, N. Y., 35 miles away. Both trains reached their appointed destinations as per schedule and to the entire satisfaction of the officers of the regiment, one of whom accompanied each.

The lessons learned from the trip were that an emergency truck is a necessity; that the drivers must be accustomed to operating over country roads and that at least three officers, each with his own car driven by an orderly, should be provided in order that proper communication can be maintained with all sections of the train.

The last of the trucks on the Middletown run arrived at the armory there twelve hours after leaving New York.

The train was commanded by Roderick Stephens, president of the club, who had as officers Messrs. Masury and Hereschoff of the International Motor Co. and Charles M. Geiger, the Peter Doelger Brewing Co., in a passenger car donated by the latter, and Joseph Husson, editor of the club bulletin and associate editor of THE COMMERCIAL VEHICLE, in a car donated and driven by Irving Davis.



AN EVERYDAY SCENE AT A PLANT FILLING WAR ORDERS

Demonstrates what can be accomplished by emergency speeding up of production. The scene was snapped at the Peerless plant in Cleveland

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Motors Indispensable for Ambulance Service

Italians Find Engines of 275 Cu. In. Displacement Are Most Suitable Size

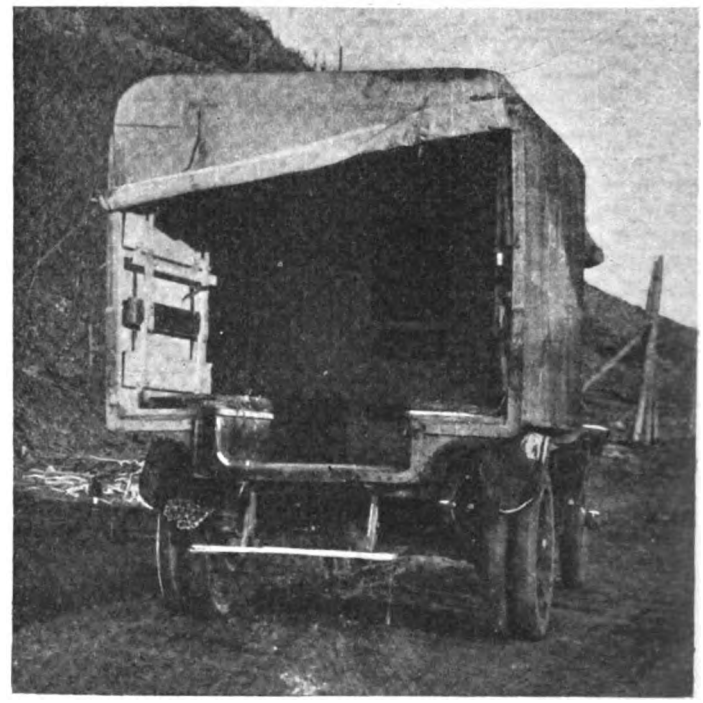
GREAT flexibility and the ability to expand to meet abnormal conditions of an unexpected attack are two important requirements of an army ambulance service which are best met by motor vehicles.

War conditions are so varied that it is hard to plan an ideal motor vehicle ambulance service for use in this country in case of fighting here, yet many lessons may be had from abroad, especially in Italy, where due to narrow roads and steep mountain grades, the operating conditions were extremely strenuous.

How Italian Ambulance Work Is Divided

The work of the Italian ambulance service is divided into three main zones or fields of operation as shown in the illustration on the opposite page. The first zone, that nearest the trenches, is the zone of operations which is almost constantly under fire and in which no lights are permitted at night. The second zone is directly behind that of the first and is under occasional fire from the enemy's long-range artillery. The third zone is at the rear of the second and is never under fire except in case of a retreat, when the equipment of all three zones must be moved rapidly to the rear to avoid capture.

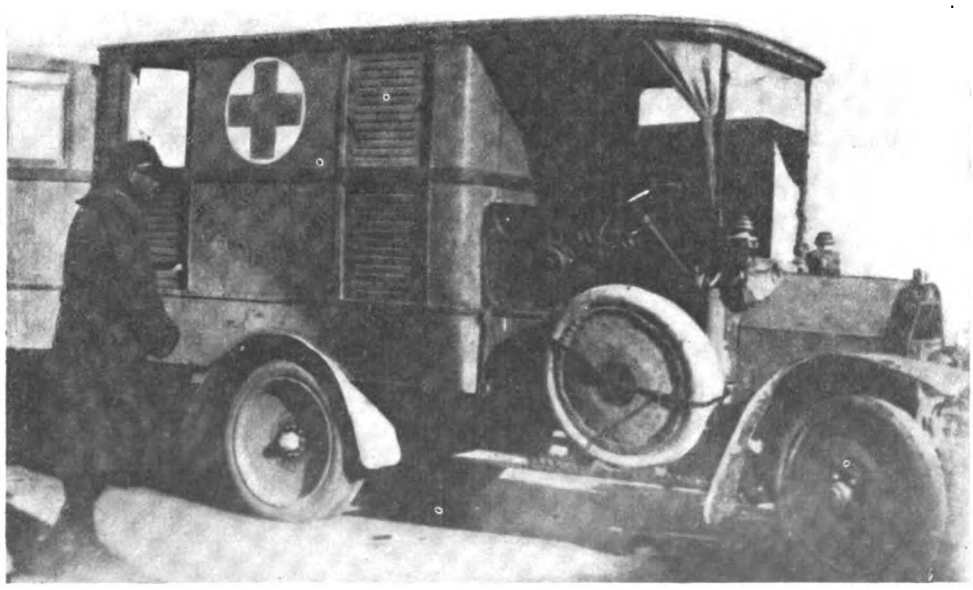
The ambulance equipment in the zone of operations consists of regimental dressing stations, short distances behind the trenches and to which the wounded are transported by whatever means present themselves. From these the wounded are moved further toward the rear to a divisional station in the first zone where temporary patching up is done. From this station the wounded are then taken back to the first clearing hospital in the second zone or to the second clearing hospital in the third zone, generally by motor ambulance and under cover of darkness if much activity prevails.



Rear view of one of the Buick ambulances used along the Italian front, showing the undercut body, the stretcher hangers, and the canvas curtain on the back instead of a door, which makes for easy access

Very serious cases requiring the immediate attention of skilled surgeons, if life is to be saved, go to the motor truck field hospital direct from the divisional station in the first zone. This truck field hospital should be within 30 or 40 minutes' motor vehicle ride from the firing line and should be capable of maintaining this distance as the army advances or retreats. The equipment comprises half a dozen trucks carrying all the tents and medical equipment, a few ambulances and probably a passenger car for the commanding surgeon. An operating tent heated with hot water radiators, obtaining their supply of water from a boiler mounted on a truck, is provided, together with X-ray installations, a sterilizing plant, running hot and cold water, electric lights and an adequate supply of beds to receive men recovering from wounds.

Less serious cases which need not be sent to the motor vehicle field hospital are transferred to clearing hospitals in the second or third zones. The majority of the cases are sorted in these clearing stations and sent to different small

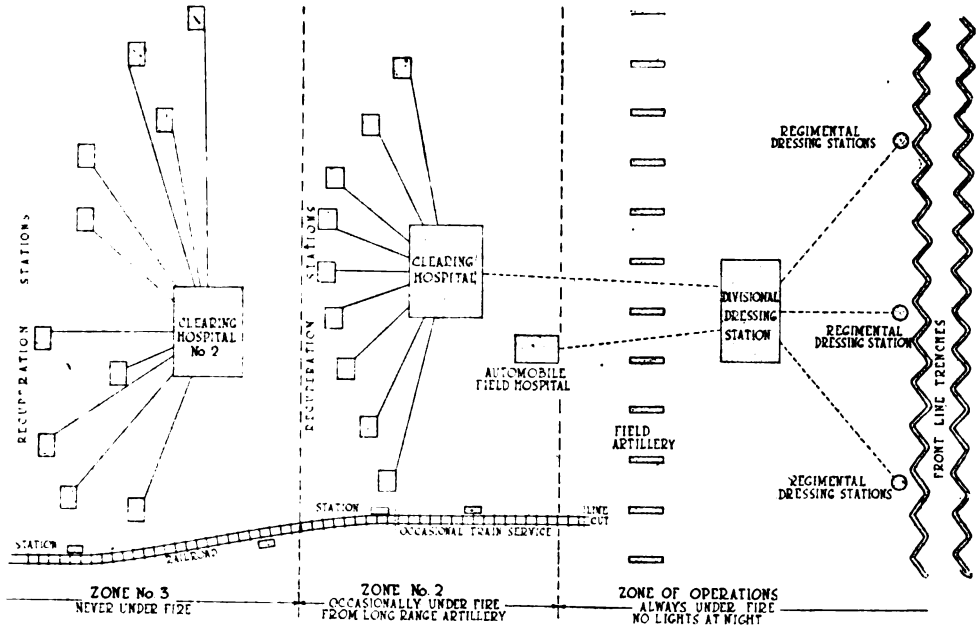


Regulation type Italian army ambulance. Note the type of steel disk wheels used as protection against shrapnel and rifle fire; the four-louvre windows on each side for body ventilation and the swinging door at the rear

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hospitals close by, each of which specializes on a different sort of injury. These smaller hospitals also serve as recuperating stations from which the convalescents are cleared out as quickly as possible and sent to base hospitals in the rear, sometimes by motor ambulances and sometimes by rail. The whole system hinges on the idea that a wounded man should be removed as quickly as possible and as far as possible from the scene of operations.

While there appears to be an impression that horse ambulances will operate nearer the front than those of the motor type, this is not the case. A successful offensive presents the most strenuous conditions for any ambulance service, for then the roads have practically ceased to exist and to move any kind of vehicle entails Herculean effort. An example of the unsuitability of horses for ambulance work was shown when the general commanding a certain section of the Italian front ordered that gasoline be economized, that all the motor ambulances should remain idle and that all wounded with the exception of serious stretcher cases should be carried by horse ambulances. The latter were kept mostly as a standby in times of great activity previous to the issuing of the order. When put into service to replace the motors the wounded had to be carried a distance of about 10 miles from the divisional dressing station to the clearing hospital. For more than half of this distance the roads were constantly under fire, the road surface very poor, with grades of from 8 to 14 per cent. With the motor ambulances loads of ten sitters and four stretchers were carried to the clearing hospitals and thence to the permanent hospitals in zone No. 3, a distance between 40 and 50 miles for the round trip, in from 3 to 5 hours.



The plan of operation of the motor ambulance service of the Italian army on the lower Isonzo and Carso fronts, showing the three zones of operation. From the regimental dressing stations directly behind the trenches, the men are transferred to the divisional dressing stations and from thence to the motor vehicle field hospital, for serious cases, or to the clearing hospitals in the second or third zones, and in turn from these to the smaller hospitals specializing on different types of injuries, where the men remain until sufficiently recuperated to be sent to the base hospitals farther inland

With four-horse teams and a load of only six wounded, the journey from the divisional dressing station to the clearing hospital, 20 miles to the round trip, took from 6 to 8 hours or almost double that of the motors. Besides this great increase in the time of the journey which was highly detrimental to the wounded, the latter had to get out of the vehicle at several points and walk and even help push the empty ambulance. At the end of the week's trial the horses were in such a condition that the officer in charge formally reported that he was unable to continue the work.



The side view of the Buick ambulance shown at the top of the opposite page and illustrating the use of cushion wheels for easy riding and the partly-inclosed cab for protection of the driver

Engines of 275 Cu. In. Displacement Most Suitable

The horsepower of the engines fitted in army ambulances varies according to the nature of the country in which the operations are being carried on, but the Italian experience has been that vehicles with engines of 275 cubic inches piston displacement are sufficient for ambulance service on any front. An engine of this size with a maximum load of ten patients makes a very suitable combination for work at the front. Naturally, in the base towns where road surfaces are always good, other combinations of smaller engines or bigger loads may be suitable. It has also been found that disk wheels are preferable to wooden ones for ambulance service because of their longer life and the protection afforded against shrapnel and rifle fire.

The abnormal conditions under which the motor ambulance service must work when infantry attacks are launched are somewhat offset by the fact that at these times there are numbers of trucks which are not actually engaged, such as, for example, those normally employed for bringing up all kinds of building materials used by the engineers. The work of the regular ambulance vehicles can be aided by the use of these trucks provided they have internal fittings allowing them to receive transverse seats at a moment's notice.

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Motor Trucking Centers of America—VI

DETROIT

Thorough Motorization of Motor Metropolis Essential to Its Industrial Development

DETROIT, MICH., March 30—When motor trucks are mentioned Detroit is probably the first city that comes to mind, as the City of the Straits is first in the world in the production of these vehicles. In their utility she is not so well known, although it is common knowledge that she leads all others in the use of trailers. There are few cities in the world that can boast 4300 commercial motor vehicles, and yet at that Detroit is not nearly so well motorized as she might be—as she soon will be.

One of the reasons for this is that Michigan's metropolis is not a great distributing center, such as Chicago, Boston, Cleveland, and others. It is as a manufacturing city that she is prominent, being the leader in motor vehicles and parts manufacture and in the production of adding machines. She is second in the country in the stove industry, first among lake shipbuilding ports, the second in the country in the ownership of passenger vessels, third in building construction and a leader in foundry and machine shop products, tobacco manufactures and corsets.

Motor trucks find their chief utility in use by manufacturers, in the distribution of supplies and products from wholesalers to retailers, and in construction work. Retail delivery constitutes a minor portion of the transportation performed by motor in Detroit. The great development of inter-city hauling which is to be found in New England, the Metropolitan district of New York, in the Chicago district, southern California, and in Maryland, has no counterpart here, principally because Detroit has few populous neighbors accessible by good roads.

Poor Roads Hamper Inter-City Haulage

Toledo, for example, but 62 miles away, is almost inaccessible because of the absence of a good road between it and Detroit. The country surrounding Detroit is principally agricultural, instead of industrial, as in New England, and settled comparatively sparsely.

Progressiveness is unquestionably the principal reason for the extensive use of motor trucks in Detroit. Detroit is one of the wonder cities of the century, having increased nearly threefold since 1900, or from 286,000 population to 755,000. Her growth has been so rapid and unforeseen, indeed, that she has suffered acutely from growing pains, many features remaining typical of a minor city while in other ways she is a metropolis. It has seemed impossible for her street railway transportation and telephone facilities to keep pace with her growing requirements, and the rapid rise of tall buildings in her business centers with the inrush of motor cars has created traffic problems that are staggering.

This traffic congestion has rendered efficient merchandise transportation a necessity. It has increased rents in close-in sections and boomed suburban development. This in turn has lengthened hauls necessary to supply the new subdivisions, all of which have combined to promote the demand for trucks.

Streets Well Paved Diagonal Arterial Thoroughfares

Detroit is physically well prepared for this extension of motor traffic because well paved and laid out roughly in the shape of a fan, with arteries extending diagonally to all parts of the city.

She has not been limited in the development by lack of ready money, for her teeming industrial life has made her one of the most prosperous cities in the Middle West.

The prosperity of any city is well reflected by the proportion of motor cars to population. In this respect Detroit stands about third among United States cities, there being one car for every nineteen persons. In a pinch, the entire population of Detroit could be transported at the same time in its own motor cars. The majority of the cars owned in the city are used by employees of the big factories. Even journeymen laborers ride about the city in motor cars. A recent emigrant from New York discovered to his amazement that his window washer made his rounds in a small runabout.

Geographically, Detroit is laid out like a great fan. Its base is the Detroit River, connecting Lake Erie with Lake St. Clair. The river at this point runs from east to west, with Detroit to the north and Windsor, Sandwich, Walkerville and Ford, Ont., to the south. As the river is the base of Detroit, Woodward Avenue is its backbone. This wide thoroughfare extends due north from the river, far out into the country, being the main road to Pontiac, Flint and Bay City.

The center of the city is the Campus Martius, an irregular square from which five arterial streets radiate in as many different directions. On this square is the City Hall, the actual center of the city. Its boundary describes an irregular arc on a 5-mile radius from the City Hall. About ¼ mile north of Campus Martius is Grand Circus Park, a semicircular plaza from which a number of streets radiate to the south in regular pattern, joined by other semicircular cross streets. This park is surrounded with a number of large hotels and new business sky-scrapers.

Railroad facilities consist of a double belt system of tracks around the city and a long diagonal line on the west side. This scheme serves most of the important plants effectively and affords a great amount of railroad frontage. Because of the manner in which these belts surround the business centers at different distances from the City Hall most of the large factories are located at a distance from the business center.

Due to this condition the distances between different plants, and different units of a given concern's combined facilities, there are long hauls to be made. This accounts for the fact that while in other cities manufacturers are seldom big users of trucks, they are prominent among Detroit owners. An example of this work is afforded in the case of the Studebaker company, operating three big plants in the city at a great distance apart. Components produced in one of these plants must be trucked to other plants for final assembly.

Body Manufacturers Use Trailers Extensively

Several large body manufacturers are located in Detroit, all of which must deliver completed or partly-finished bodies to manufacturers or to finishing and trimming concerns, who in turn must pass them on to the car manufacturers. Much of this local transportation is by truck and trailer. Large parts makers, such as the Timken-Detroit Axle Co., the Continental Motors Corp., the Northway Motor Co. and others use motor haulage extensively to deliver parts to assembling truck and car manufacturers.

Detroit is a manufacturing center, rather than a distributing point. Her manufactures rank fourth in American cities, amounting to $402,864,000 in

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1916, a gain of 59.2 per cent since 1909, in which time she jumped from sixth place to fourth. Because she is not a vital distributing center and because of her isolation both geographically and by poor connecting highways, inter-city transportation is not done to any great extent by motor truck, although there is considerable and growing activity among dairy and produce farmers in bringing their products to the Detroit market by truck instead of by train or horse wagon.

The commerce of Detroit is considerably augmented by her importance as a port. More tonnage of shipping passes through the Detroit River than any other channel, surpassing by a big margin that of the Suez Canal. This is one reason for her pre-eminence as a lake shipbuilding port. Trucks are called upon to assist in the work of producing these ships. Prominent in this industry are the Detroit Shipbuilding Co. and the Great Lakes Engineering Co.

Center of Our Largest Manufacturing Industry

The motor car industry, which centers in Detroit, is rated as the biggest manufacturing industry in America. In 1916 950,000 cars valued at $600,000,000 were manufactured in Detroit. There are more than thirty-five motor vehicle factories in Detroit, employing about 60,000 people. Parts and accessory manufacturers to the number of 113 employ more than 130,000 people. The payroll of motor car workers amounted to $67,000,000 in 1916; the production per person averages $6,600.

There are fourteen different makes of trucks whose home is Detroit, these being the Acason, Commerce, Denby, Dodge, Dominion, Federal, Hall, Lincoln, Maxwell, Packard, Signal, Studebaker, Universal and Wilson.

Other important industrial concerns are the Burroughs Adding Machine Co., American Cigar Co., American Lady Corset Co., Timken-Detroit Axle Co., the Continental Motors Corp. and others.

Besides industrial transportation of the manufacturing class, motor trucks are extensively used in construction work. Detroit has developed a motor lumber transportation outfit which is characteristic. It consists of a light tractor and semi-trailer, the tractor being a truck chassis without a shortened wheelbase. Brick, sand and cement dealers use dumping trucks and trailers extensively, and there are three important coal dealers who employ efficient truck fleets.

One reason why so many trucks are employed in construction work is that this work is pushed at maximum pressure practically the year round. So scarce are dwellings that rents have mounted to the skies and vacant houses or apartments are extremely rare.

In building construction Detroit stands third, exceeded only by New York and Chicago. Reduced to figures, building contracts in Detroit in 1916 amounted to $51,067,110, having grown from $4,142,400, or 1,235 per cent since the beginning of the century. It is the present claim of the Detroit Board of Commerce that Detroit is the sixth city, disputing this claim with Cleveland.

Bank clearings for 1916 are quoted at $2,260,547,784, a growth from $427,800,392 in 1900, representing a 530 per cent gain in 16 years, or an average of nearly a third each year.

Wholesalers use motor trucks for distribution of goods to retail stores located in different parts of the city and to the many suburbs, such as Highland Park, Hamtramck, St. Clair Heights, River Rouge, Redford and Grosse Point, and to the surrounding towns of Wayne, Royal Oak, Wyandotte, Dearborn, Munroe, Birmingham, Pontiac, Spring Wells, Mount Clemons, Lake Orion and New Baltimore, in Michigan, and Windsor, Walkerville, Ford, Sandwich and London in Ontario.

While a certain proportion of the trucks are used by retailers, Detroit is remarkable in the small extent to which retail delivery by horse or motor either one is given. With its great distances, poor street car service and general prosperity, it would be natural to expect a great deal of motor delivering, but the fact is that Detroit housewives seem to have acquired the excellent habit of doing their purchasing after personal inspection and carrying home the groceries, meat, etc.

No doubt the extensive use of motor cars by those who can afford them renders the carrying home of purchases more attractive. Of course, the department stores, of which Detroit has a number, employ motor delivery extensively.

Due, possibly, to the rapid growth of industrial and commercial Detroit, much of the transportation over the streets is done by truckmen, working at a daily rate or on contract instead of by vehicles owned by the concern having the goods to be delivered. Truckmen, cartage transfer concerns or haulage contractors, as they are variously called, are by far the largest single class of truck users in Detroit. Competition and the strenuous rate at which all commerce is carried on in Motor City have crowded out those who stuck to horses to a great extent, so that motor trucks are the typical rolling stock of these small enterprises.

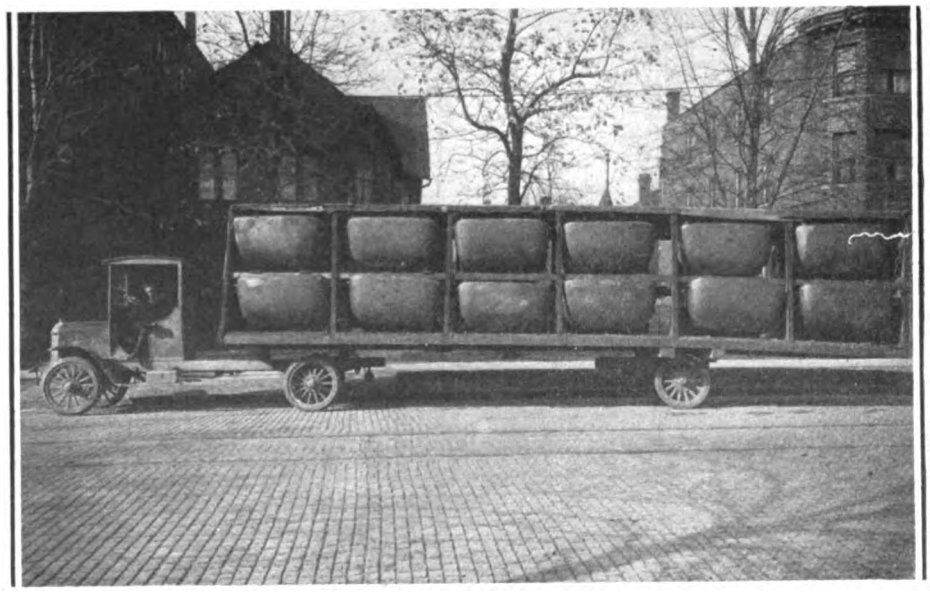
These outfits usually consist of small fleets of from 1½- to 3½-ton trucks. In a large portion of the work yearly or monthly contracts are made, the trucks being specially equipped with bodies adapted to the work, painted and lettered to the order of the concern. Small job work is done at a rate, usually, of $1.50 to $1.75 per hour.

Why Motor Truckmen Prosper in Detroit

Much of this service is availed of by those concerns which operate their own fleets of trucks, to care for fluctuations in volume of deliveries. For example, the builders' supply companies are accustomed to hiring trucks for the busy season in fine weather, their own equipment serving only for the average volume of traffic which obtains throughout the year. The coal companies mostly rent additions to their normal equipment during the cold months, when the demand for coal is at the highest.

Unless their trucks are rented on a yearly contract basis, in which case the body, painting and lettering are to the order of the customer, these truckmen all use practically the same type of body, a platform type with a low stake-and-rack combination for the sides.

While the north and east have heretofore been the big manufacturing centers of Detroit, the west side is now developing rapidly and the northeast section. The large factory furthest north is incidentally the largest factory in the city and the biggest motor car factory in the world—the Ford Motor Co.'s works. It is 4 miles north, on



Type of haulage equipment especially developed by Detroit and common in its streets—a body manufacturer's tractor and trailer hauling bulky passenger car bodies to a motor car plant. The tractor is a Wilson, made in Detroit

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Woodward avenue. There is a group of factories to the east nearly as far away, these being the Hudson, Chalmers, Lozier, Signal and Continental factories. So far, about as far west as large factories are to be found is 2½ miles—the Timken-Detroit Axle Co., the Studebaker Corp. and the Paige Motor Car Co.

Owing to the assurance that the Pennsylvania Railroad company will build a $5,000,000 terminal on the west side to connect Detroit with its great system, twenty-two companies are moving to the west side, and when located will employ, it is conservatively estimated, 85,000 men.

In the moving business Detroit is perhaps more fortunate than other cities of her class in that it is not the universal custom to lease houses. Since there are almost always more applicants for houses than there are places for rent, landlords are mostly content to take their rent in advance and accept short notice of removal. Thus there is moving in progress practically all of the year, with very slight variation in volume. Consequently the transfer and storage companies are able to keep their vehicles constantly at work, and by cutting down idle time to charge more reasonable rates than in New York, for example. They also use smaller vans than are common in other large cities.

Farmers Make Good Use of Commercial Vehicles

While there is practically no intercity haulage between Detroit and other cities in its State and nearby cities in neighboring ones, farmers catering to the Detroit market have seized upon the motor truck enthusiastically as a means of better marketing and a way to larger profits. Truck gardeners come 30 miles into Detroit in the harvest season, and the dairy farmers make trips of 18 to 25 miles the year round.

In spite of heavy snows in the winter, these men bring in the lacteal fluid throughout the cold weather, although not in such volume as in the summer, because, for one thing, the cows do not give as much milk in winter as in the period of green grass. Neighboring towns from whose vicinity farmers haul their produce by trucks are Pontiac, 26 miles; Redford, 10 miles; Ypsilanti, 20 miles; Plymouth, 18 miles; Birmingham, 18 miles, and Munroe, 30 miles.

Inter-city merchandise haulage is certain to come as soon as better roads are built. If the legislature at Lansing changes the state law so that Michigan can take advantage of the opportunity to employ Federal aid, this will be doubly soon, but it will come eventually whatever befalls.

The Springfield Metal Body company is locating a plant in Wayne, Mich., 20 miles out, to which there will be an excellent road. Both for the transportation of its bodies to the trimming and painting factories and motor car works in Detroit and for the supplying of the increased populace with goods, inter-city haulage will be initiated.

One truckman living in Royal Oak in about a year's time, from next to nothing but a little borrowed capital, has built up a profitable business hauling between Pontiac and Detroit, 26 miles, and purchased three large trucks. News of this sort soon travels around and imitators are bound to spring up.

When the new road to Toledo, on which the state has been working for more than a year, is completed, Toledo, 62 miles away, will be bound to Detroit by a network of truck lines.

Close to 100 different concerns who do motor trucking are located in Detroit. That motor trucks predominate in this work is due to the axiom accepted by practically all Detroit transportation men that motor vehicles should be used for long hauls, horse wagons for short ones. When these men learn that the latter half of the belief is faulty, and that it is belied by experience in other cities, the use of trucks will become more universal, even, than it is.

One reason for the prevalence of rented and contract haulage service is that it is cheaper in most instances because haulage rates are so much below those in other large cities. This is because truckmen are always assured plenty of work to do and the supply of drivers capable of taking proper care of the trucks is better perhaps than in any other city, thanks to the motor car companies.

Traffic conditions in Detroit are in many ways peculiar. In the business section it is very congested, but the congested area is not more than ½ mile square except on Woodward Avenue. In this zone the greatest efficiency from the streets possible has been derived by intelligent police regulation. Parking in this district is prohibited save for a few spaces on wide streets where limited time is allowed. In a zone surrounding this district for perhaps another ½ mile parking for 1 hour is permitted and in some locations for 2 hours, unlimited parking being permitted outside these zones. This leaves the streets free for traffic where most needed.

Cars which violate the parking rule are summarily taken by the police, towed to a car pound and are only restored to their owners upon payment of a fee.

Traffic Rules Are Favorable to Trucks

Business houses which use motor trucks are protected from traffic congestion at their frontages by rules against parking there except for the trucks used by such concerns or those of firms taking or delivering goods to them. Signs are placed prominently in such places. In these places the trucks are allowed to stand as long as may be necessary.

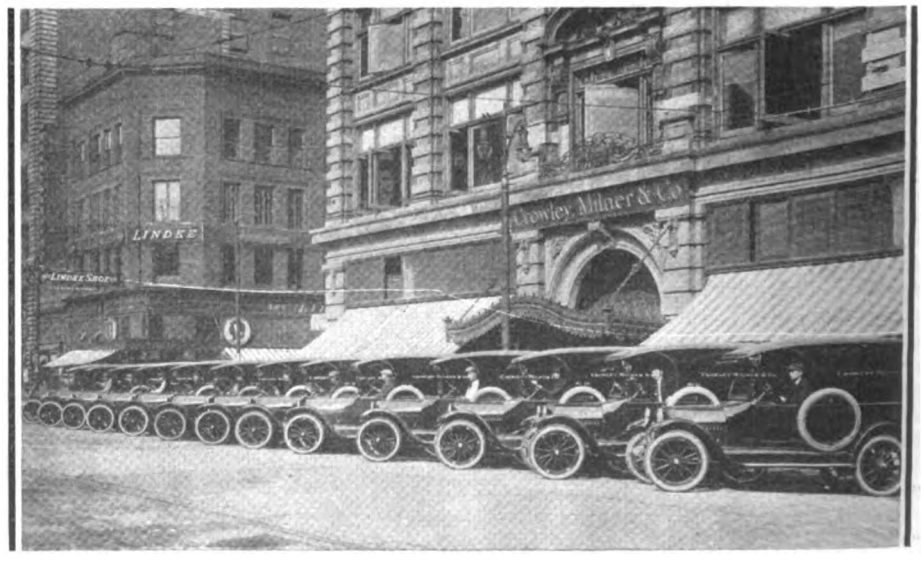
Detroit has many good alleys which are well paved, and these are a great aid to commercial traffic. The narrow ones are regulated by one-way traffic rules, thus preventing blocking them.

Pedestrians are also regulated in Detroit, although not as rigidly as before. However, police regulations prohibit crossing blocks between intersections and require that all corners be crossed straight, and not diagonally.

Paving in Detroit averages good. There was 592¾ miles of paved street in Detroit January 1 last, of which 157 miles was sheet asphalt on a concrete base; 143 miles, cedar block on concrete; 123½ miles, brick on concrete; 76½ miles, asphaltic concrete; 50¾ miles, creosote block on concrete, and 26 miles, reinforced concrete. The balance, or 16 miles, is medina block, granite block, block asphalt, one-course concrete, macadam, cobbles on concrete, bituminous macadam, cedar block on sand and stone.

Of this paving, 45¾ miles was laid in 1916 and 20 miles additional was resurfaced. Most of the re-surfacing was of sheet asphalt and creosote block and of the new paving 34¾ miles was of asphaltic concrete on concrete.

In addition to this, Detroit has 72½ miles of paved alleys, 46 miles of which is of concrete, 23 miles of brick and but 3½ miles of sheet asphalt, creosote block and cobble stones.



Detroit department stores are well motorized. Here is a portion of the fleet of Studebakers used by Crowley, Milner & Co., one of the largest in the city

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Chicago Motor Bus Line Starts —To Have Fifty Buses

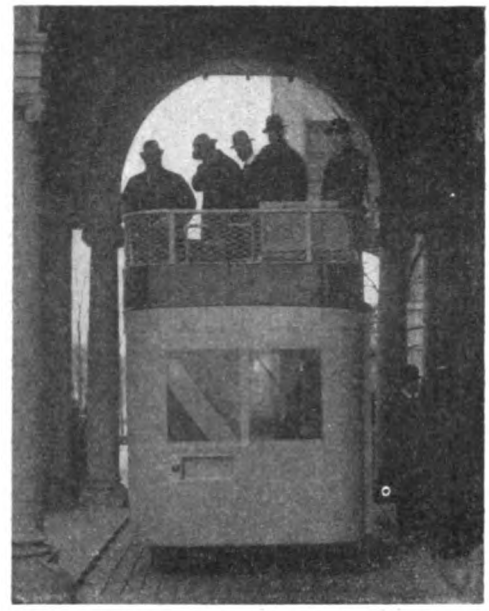
Front-driven, Low Double-deckers

CHICAGO, April 9—Motor buses have at last come to Chicago, the initial fleet numbering fifty, of which a score are already in use. They differ radically from the usual type as used in London, Paris and Berlin, and copied in New York, having front drive and exceptionally low floors. They are double-decked, but avoid the top-heaviness and danger of the usual double-decked bus by low suspension and an inclosed stairway.

They are operated on a route in the fashionable north shore district of Chicago, extending from Devon avenue south in Sheridan Road through Lincoln Park, then down the Lake Shore Drive and Lincoln Parkway to Ontario Street, to Rush Street, across the river, via the Rush Street bridge and south on Michigan Boulevard to Randolph Street, west on Randolph to La Salle, south on La Salle through the financial district to Adams and then east to the terminal at State and Adams Streets. This route serves the most fashionable sections of the city and the seat of the biggest business.

The buses will operate on from 3- to 6-min. headway, when the fleet is complete, from 6 a.m. to 1:30 a.m. They are manned by a driver and a conductor and seat fifty-one passengers, or more than the largest of the Fifth Avenue buses in New York. The lower deck is not more than a foot from the ground and has a sliding entrance door at the rear. There are no steps, the passenger walking directly into the lower deck. Twenty-two persons are seated on the lower deck and twenty-nine on the upper one.

The low floor has been achieved by centering the power at the front, the front wheels being the driving wheels, so that there is no live rear axle or driveshaft to restrict the height of the floor at the rear. The front portion of each bus is in effect a two-wheeled tractor, with the rear a two-wheeled trailer.



Rear view of one of the new Chicago buses, showing nearness to ground and inside stairway

Power comes from a Moline-Knight engine, similar to that used in the new F. A. C. buses in New York. It is 4 by 6, four-cylinder, and cooled by a finned-tube radiator in a cast casing, this member being of unusual size, to care for cooling in traffic in warm weather. The driver occupies a partially inclosed cab with high side doors and a cowl dash.

Drive is through a three-speed selective gearset to a silent chain and sprocket connection with the driveshaft, situated at the right of the engine. This shaft drives the worm-driven front axle, the steering knuckles of which are globular and inclose universals to transmit the drive when making turns. Brakes are on the rear wheels.

Complete Electrical Equipment

Complete electrical equipment is fitted, comprising a Bosch magneto and Bosch electric starting and lighting. A Zenith carbureter is fitted.

The buses are the product of the Gas-Electric Motor Bus Co., New York City, the rear sections and bodies being built by the St. Louis Car Co., St. Louis, Mo. The first bus was put into operation March 25. All of the chassis have been built and deliveries are being made as fast as the finishing touches are completed. The Chicago Motor Bus Corp. is the owner, of which Roland R. Conklin is president.

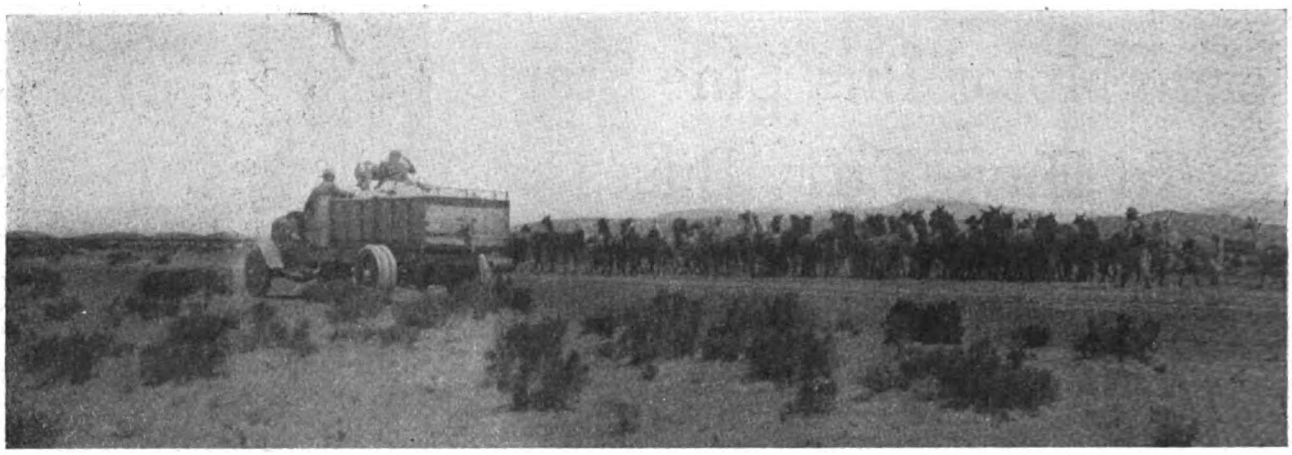


A Chicago bus in service—Note comfortable accommodations for the driver and stable lines lent by low suspension of body

Send Us Ideas on Good Truck Repairs

See Pages 26 and 27

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The old and the new—a herd of llamas, the slow and stubborn animated vehicle of 100-lb. carrying capacity capable of 8 miles daily, regarding the first motor truck on a summit mesa of the Great Andean Divide, in Bolivia, at an elevation of more than 15,000 ft. above sea level

Trucks Replace Llamas in Highest Andes

Beecroft's Predictions Proved by Motors Hauling Nitrates

By John Grant

PROOF of the bright opportunity for motor haulage development in South America, as enunciated in the series of articles on South American commercial transportation by David Beecroft, published during the latter part of the year past, is afforded by the successful installation of four American trucks in the lofty heights of the Bolivian Andes, being used in the transportation of valuable minerals between Oruro and Uncia, which may be found on the accompanying map. These trucks have the distinction of operating over the most altitudinous route traversed regularly by any gasoline vehicle in the world. It is reported that the elevation at which they cross the summit of the Andes is 17,300 ft. While there is in North America no government survey information in support of this startling record, its exact probability is indicated by the fact that the Potosi branch of the Bolivia Railway Co. crosses the summit at the exactly determined altitude of 15,814 ft. as stated in the publications of the Antofagasta & Bolivia Railway Co. It is obvious that the railway has sought the very lowest pass in this locality for making its crossing. The general character of the country is well indicated by a statement from the railway company's description of the territory it traverses in this summit region:

"One cannot fail to be impressed with the broken, wind-swept and often snow-covered country traversed, and the difficulties met during the construction of this railway evinced by deep cuttings through solid rock as the line winds round mountain after mountain only apparently to meet obstacles more insurmountable than before."

Further on the circular paints a word picture of Oruro, which it describes as a town of 8,000 inhabitants, situated at about 12,000 ft. above the sea. The houses are mostly built of sun-dried bricks plastered on the outside and painted different colors which give a very picturesque appearance to the street. Here, also, most of the windows are decorated with boxes of flowers, a rather uncommon feature in South American towns. There are valuable silver and tin mines in the neighborhood as indeed in most parts of Bolivia, which is probably the country richest in mineral wealth in the world and now, owing in great part to the liberal policy of the government and its enlightened president, General Ismael Montes, is being opened up by a network of railway lines constructed and worked under the same directorate as the Antofogasta railway.

On the route from Oruro to La Paz via the railway, it is surprising to note that first one encounters much swampy country, but soon this changes for rough stony ground on which grows a short scrub affording food for llamas and donkeys, which are seen in large numbers, and later on this again changes for rough grass and one reaches the grazing ground which from time immemorial has supported the flocks of the Incas and their descendants.

The llama, an animal which the North American reads of and sees pictured in his school books, and in after life remembers as almost a fabled creature as unnatural as the saber-toothed tiger of the antediluvian era, has hitherto been the indispensable factor in supplying the haulage medium which has made mine working in this difficult country of the



Unloading trucks at Antofagasta, the great nitrate port of Chile—very heavy crating was required for the long voyage from Los Angeles down the west coast

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higher Andes at all possible. The photograph here reproduced of the flock of llamas with heads raised high, ears pricked forward and their whole bodies alert and quivering as the monstrous gasoline rival charges by, is undoubtedly a most prophetic picture of motor vehicle domination in the transportation world.

The limitations of the llama are such that his services can only be employed in connection with the transportation of extremely rich ores of the most valuable metals.

The publication of the Antofagasta & Bolivia Railway Co. is again referred to in comfirmation of the general exactness of the specific statement supplied by the writer's informer, who has seen these trucks in service in the Andes. Prior to the construction of the railway one of the most important llama routes was from Potosi to Uyuni, which is on the seaward side of Oruro, the terminal point of the new motor truck line. In this 125-mile haul from Potosi to Uyuni the llamas were driven in troops of 100 or more and took 15 days on the journey. Apparently the llama is fully as leisurely in its movements as the deliberate and stubborn jackass. Each llama carries a load of 100 lbs. in weight and it is said they will not move if this weight is exceeded in the smallest degree.

The fleet of trucks in operation in the territory, which is shown by the rivers on the map to be the very summit of the great Andean divide, was started with the trial of a 4-ton Moreland, which, after it was got in successful operation admittedly by the solving of many new problems and overcoming of difficulties in great variety, was followed by three additional trucks, a 1-tonner and two 2½-tonners. These trucks were shipped to Antofagasta, Chile, from the port of Los Angeles. THE COMMERCIAL VEHICLE in a recent number presented a photograph of the trucks being loaded for shipment to Antofagasta.

On their arrival at that port, which is the big nitrate port of Chile and the wholesale shipping point, they were loaded aboard the train for Oruro, Bolivia. Their transportation was effected over the Antofagasta & Bolivia Railway Co.'s line, a 2 ft.-6 in.-gauge mountain line which is built and constructed in a strictly high class manner, with high grade rolling stock, and is commonly understood to be the most prosperous railway in the world. Going up from Antofagasta the railway took the trucks to an altitude of 13,000 ft. in 223 miles. In the first 18 miles the line climbs 100 ft. to the mile, an average grade of one in 50 or 2 per cent, but in several places it is as steep as one in 30 or 3⅓ per cent. This was only prophetic of what the trucks would have to encounter and surmount themselves at the vastly higher grades and in the rarefied air of the very summit in which they were to operate.



A milestone in the progress of motor truck export—a Moreland truck in Antofagasta, Chile

The thinness of the air is apparent from the fact that passengers on the railway usually stop at Calama, 7400 ft. above the sea, for at least a day before going into the higher altitudes to accustom themselves to the change in atmospheric conditions, and oxygen apparatus is carried on every train for the relief of passengers seriously affected by the rarefied air of high altitudes.

The trucks are operating on a haul of about 50 miles between Uncia and Oruro, transporting tin. The gasoline they burn costs $3.50 a gallon, Bolivian, equivalent to about $1.25 U. S. gold. Naturally the items of compression and carburetion were the fundamental physical problems which had to be solved prior to the successful operation of the trucks.

The first truck shipped required a great deal of experimenting on the job. After the conditions and necessary adjustments to meet them had been ascertained the later trucks were prepared for working at this altitude in the factory. Among other things, the compression was increased to about 125 lbs. at sea level, which is reduced to about one-half that figure at the altitude at which the trucks are working. It is particularly interesting that under these conditions a test run at sea level was not made, as it would have had no value, possibly the reverse. Carburetion is effected with the Ensign carburetor, which requires no adjustment for altitude and the regular standard model, the same as used on many Moreland trucks in service in California and other Western states is employed.

The trucks have been practically compelled to make their own roads. Their first trips were over a trail originally prepared for the llamas and left very rough, although widened. There is plenty of gravel in the country and in practical operation, as the trucks have only the outward haul under a load, they are using the back haul for road building purposes, taking in a load of gravel and dumping it where it will be of the most service to themselves on each return trip.

The Andean summit installation is of double interest, perhaps primarily on account of its demonstration of the ability of continuous working at an unprecedentedly high altitude, and secondarily as showing that there is no such thing as an insurmountable barrier to the gaining of export trade for American motor trucks. In fact, in this particular locality the Moreland company has been quietly working for some time and has satisfied the most important transportation requirements of the district. Some of its trucks are operating in La Paz, the capital of Bolivia, others in Antofagasta, and on March 18 the Moreland company is shipping from its Los Angeles factory a sprinkler and two dump trucks for the garbage department of the city of Antofagasta.



At a 16,000-ft. elevation—the head of a mighty canyon amidst the towering summits of the metalliferous Andes

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Better Truck Maintenance and Repair

Send Us Your Ideas

Make a rough pencil sketch of some good motor truck repair or maintenance method you have made or employed and mail it to us with a short letter telling how you did it

TRUCK repairs and maintenance are of the greatest importance to every motor truck user. All trucks need repairs at some time or other. The cost of such repairs depends to a large extent upon how they are carried out. There is a short and yet satisfactory method of executing every truck repair as well as a long, tedious and costly method. The short methods will be shown on these two pages from issue to issue.

HOTCHKISS drive depends upon the spring to transmit the propulsive effort of the axle to the frame which the spring can do only if it is kept tightly clamped to the axle spring chair by its clips. Many makers who formerly fitted Hotchkiss drive have been forced to fit radius rods to their vehicles because users would not keep their spring clips tight, with the result that the springs slipped from their anchorings on the axle and messed things up generally when a particularly quick start or stop or an unusually heavy pull was encountered.

Better maintenance of their trucks by owners would have prevented this trouble and buyers of trucks would not be forced to pay the extra expense of the radius rods. An outstanding reason for the failure of Hotchkiss drive springs to stay tight, according to Walter M. Denman, New England Sales Manager, Brockway Motor Truck Co., Springfield, Mass., is that the clips are nearly always drawn up when the truck is light; that is, when it has no load on it. Indeed, in the assembly at the factory the springs are bolted to the axle without being compressed. The effect of this is to limit the degree of tightness which can be attained, so that when the spring is deflected under load the clips actually loosen and permit the springs to slip back.

Always load your truck fully when you tighten the spring clips is the advice that Mr. Denman gives and the sketches on the opposite page show just why this is necessary.

By reference to Denman's rough pencil sketches it is seen that there is a small amount of space between the top leaf and the bottom of the filler block at the center and between the bottom leaf of the spring and the spring pad or perch at both ends due to the curvature of the spring leaves when the vehicle is unloaded. As the load is applied the springs flatten out and the filler block rests loosely on the top of the uppermost spring leaf due to the fact that it becomes flat instead of curved under load. Under these conditions it is perfectly clear why clips tightened up when the vehicle is light become loose as soon as a load is applied. The remedy of loading the vehicle before tightening the clips is a very simple one.

The opposite page shows you how

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Keeping Spring Clips Tight

How Denman Does It

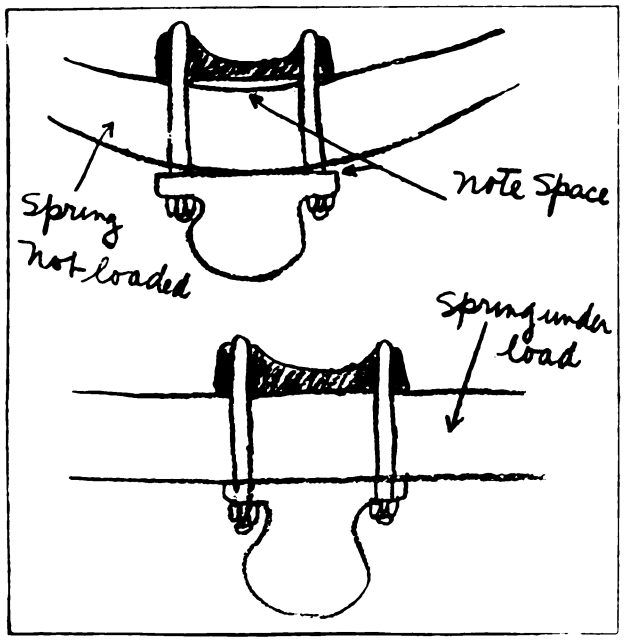
AN easy method of keeping your spring clips tight on trucks with Hotchkiss drive has puzzled many commercial vehicle owners, yet it may be very simply done, as shown on this page. But this is but one of the many small problems which confront the truck owner.

There are hundreds of others, the solution of which is perhaps of equal importance. With your help THE COMMERCIAL VEHICLE will publish your ideas as expressed in the methods you employ; will give you credit for them and besides pay the minimum of $1 for each new idea which it accepts and as much above that amount as the idea is worth.

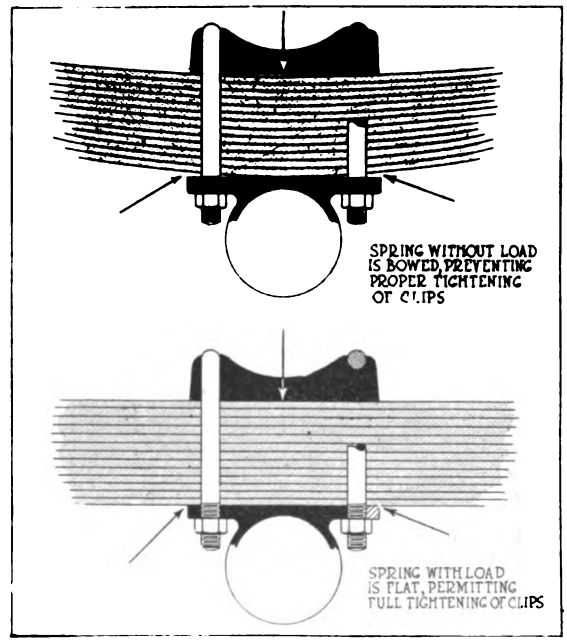
These ideas put into practice may save you $25 or more a year. If you have ten trucks, that small saving would amount to $250, a sum not to be thrown into the gutter in these days of the high cost of living.

The Steps Denman Takes to Keep Spring Clips Tight

1—See that truck is on level ground.
2—Load truck with capacity load.
3—See that load is evenly distributed.
4—Take up tight on spring clips.



Rough pencil sketch which Denman made for THE COMMERCIAL VEHICLE



Denman's sketch after THE COMMERCIAL VEHICLE *artists had redrawn it*

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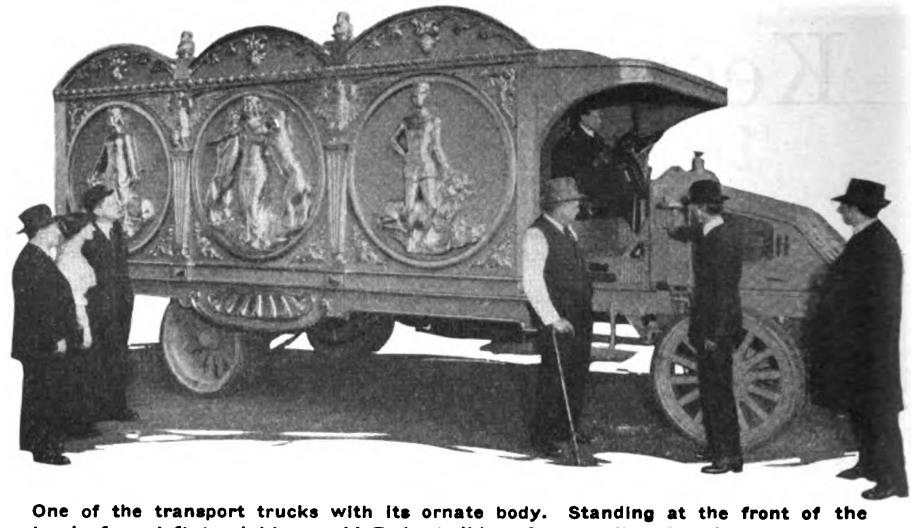
Transport Staff of Motor Circus Is Organized

Border Army Drivers to Operate Trucks

PREPARATIONS for the Spellman-Bostock-Kirafy Combined Motor Circus which is to be sent out in May, it is expected, by the United States Circus Corp. are rapidly being completed. The show itself, including animals and performers, is now practically ready and the transportation arrangements now await the completion of the elaborate parade bodies which are to form the principal feature of the show. Most of these bodies have already been completed by the Bode Wagon Works, Cincinnati, O., the illustrations herewith showing the work in progress.

The personnel of the transportation outfit has been recruited, consisting of A. Roy Knabenshue, director of transportation; Jake Posey, for 10 years superintendent of transportation for the Hagenbeck-Wallace Shows, superintendent of motor trucks; E. Lewis, who was truckmaster of Truck Company 59 of the United States Army on the Mexican border, superintendent of drivers, and 125 drivers, most of whom were formerly in Lewis' train of Kelly-Springfield war trucks, and all of whom were employed by the government to drive the trucks of our border expedition.

Such a personnel, it is felt, will go a long way toward insuring the success of the enterprise, for the drivers and their immediate superiors are by experience experts in the handling of this particular make of machine and masters of the art of tooling trucks through almost any sort of ground surface that might by courtesy be termed a road.

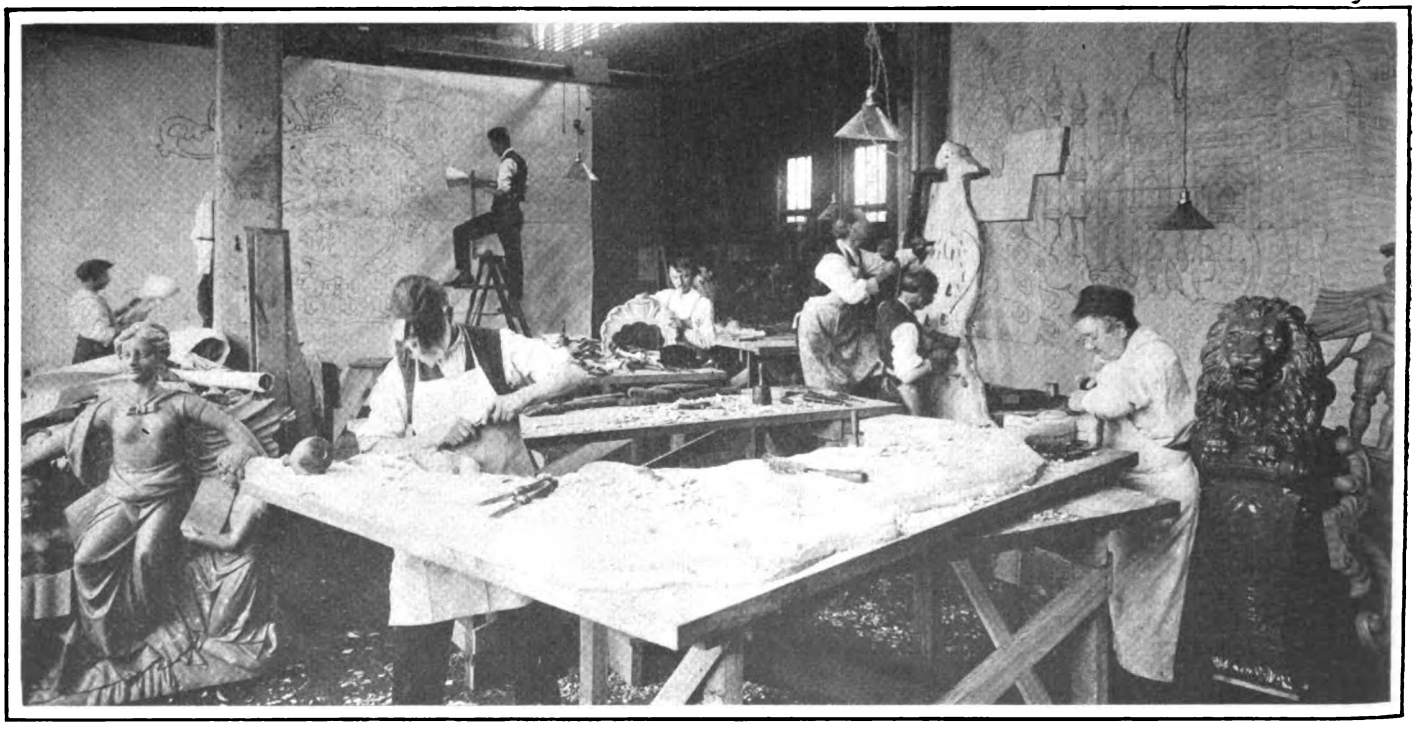


One of the transport trucks with its ornate body. Standing at the front of the truck, from left to right, are Al Bode, builder of the bodies; Frank P. Spellman, president and general manager of the circus, and Mr. Kirafy, producer of the spectacles in the show

First photographs of motor circus bodies to be published, supplied exclusively to THE COMMERCIAL VEHICLE by the courtesy of the United States Circus Corp.

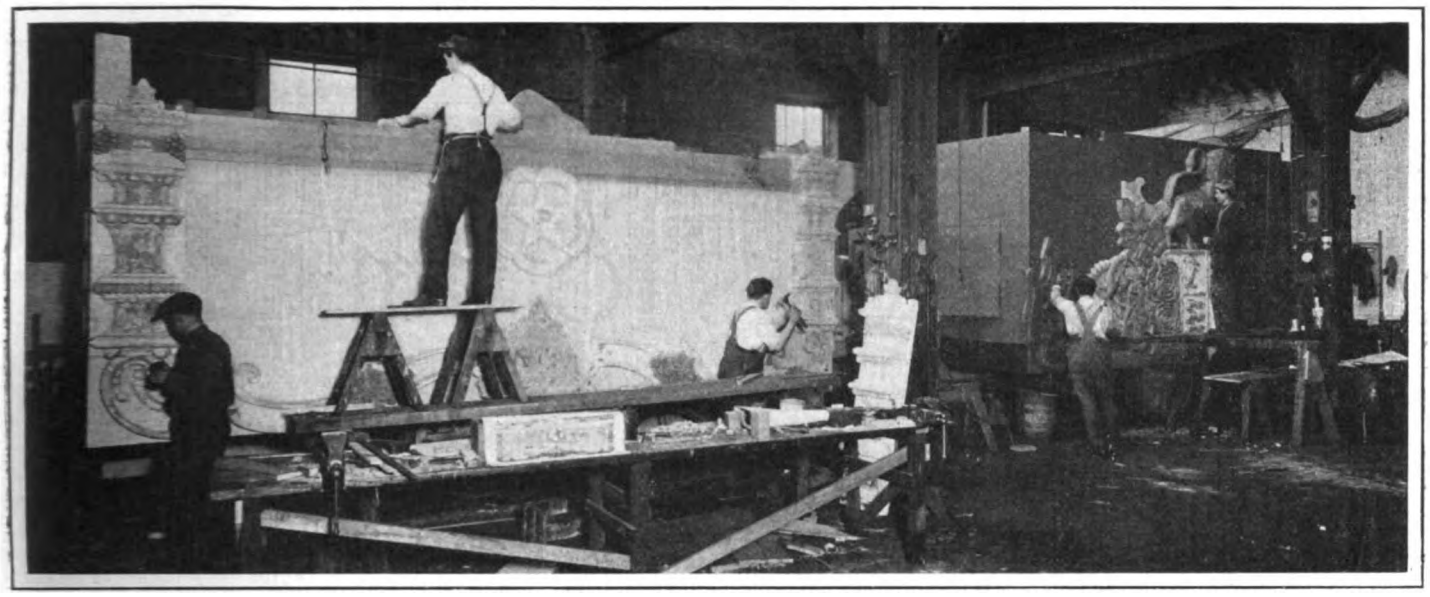
As suggested before, the circus is to be used as a strong aid to the good roads movement, and the endorsement and co-operation of the Dixie Highway Assn., the Lincoln Highway Assn., the Boone Trail and others has been enlisted. A number of road commissioners have expressed their willingness to accompany the circus over routes under their jurisdiction to learn at first hand the road needs of motor traffic. As the complete train will consist of 100 Kelly-Springfield trucks and seventy Troy trailers, its passage over the roads will represent such a demonstration as few of these commissioners will have ever witnessed before.

In addition to the motor trucks there will also be a number of passenger cars and perhaps some motorcycles. Fifteen Overland chassis have been purchased,



Wood carvers at work on the India float. Germans and Italians here work side by side. The carvers cut the designs in relief from the drawings on the curtain at the right. In the background the artist is seen making the sketch for the German float, which may have to be suppressed

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Mechanics applying carving on Panama and Great Britain floats

thirteen of which will be used by the various advance crews, and two others will be for the personal use of Frank P. Spellman, president and general manager of the enterprise and the one who conceived the idea of the motor truck circus. One of these will be a sedan for ordinary traveling and the other an ornate herald car, arranged with carved figures of lions and tigers, in which Mr. Spellman will lead the parade, accompanied by four young women heralds equipped with trumpets.

Toledo, the home of the Willys-Overland company, may be selected as winter quarters of the show, the business men of which city are raising a fund to secure the proper site for the permanent buildings to house the equipment and animals during the cold months.

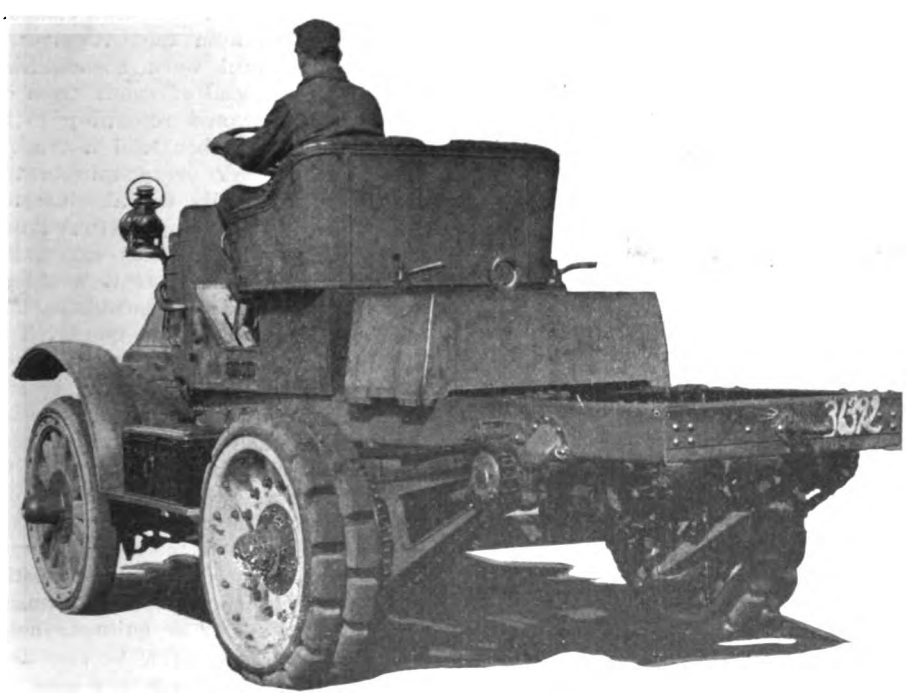
The parade bodies will include a pageant of nations, each nation represented by a carved float mounted on a Kelly-Springfield chassis. These floats are of carved wood and exceedingly ornate, being considered by many authorities some of the best examples of this class of art in existence. On parade, seats at the top, but concealed from the public view, will accommodate performers garbed in the national costumes of the countries represented. On the road, however, there will be canvas covers over these bodies to protect them from the elements. The insides of all of these ornate superstructures will contain generous stowage room for equipment, so that each will serve the triple purpose of providing a parade feature, a cargo truck and a tractor for one of the trailers.

Through an error it was stated in previous articles that the Kelly Snake, which is to be used with the road crew for the most difficult jobs of pulling, was to be a new sort of caterpillar tractor. This is untrue, it develops, as the Snake is merely a standard Kelly short-wheelbase tractor. Its specifications are the same as those of the 3½-ton trucks except that its rear axle is placed in front of the jackshaft instead of behind it, and the frame is cut off to a short length. A heavy iron weight is carried just back of the driver's cab to provide traction for the wheels.

The illustrations herein presented are the first actual photographs of the motor circus bodies yet published by any magazine.

How to Keep Your Spring Clips Tight

See Pages 26 and 27



This is the Kelly Snake

Delegates Appointed to Preparedness Board

CHARLES CLIFTON, president of the National Automobile Chamber of Commerce and of the Pierce-Arrow Motor Car Co., and John N. Willys, president of the Willys-Overland Co., Toledo, Ohio, have been appointed delegates to the National Industrial Conference Board of the National Automobile Chamber of Commerce. The board was formed last May to engage in industrial research, to publish its findings so that they will be readily available, and to advise legislative bodies in the framing of laws which regulate industry.

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The Readers' Forum

Devoted to topics pertinent to commercial vehicle operation design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

ELECTRIC INDUSTRIAL TRUCKS

Eleven Manufacturers of Battery Vehicles for Indoor Transportation

To the Editor, COMMERCIAL VEHICLE:

Please advise us the names of one or more firms that manufacture electric trucks such as used by large manufacturers and jobbing houses to transfer merchandise from one department to another.—TREVOR & MORRIS, Key West, Fla.

There are eleven such manufacturers, as follows:

Automatic Transportation Co., Buffalo, N. Y.

Buda Co., Chicago, Ill.

Cowan Truck Co., Holyoke, Mass.

Galion-Dynamic Motor Truck Co., Galion, Ohio.

Orenstein-Arthur Koppel Co., Koppel, Pa.

Elwell-Parker Electric Co., Cleveland, Ohio.

General Vehicle Co., Long Island City, N. Y.

Samuel L. Moore & Sons Corp., Elizabeth, N. J.

Hoagland-Thayer, Inc., Newark, N. J.

C. W. Hunt Co., West New Brighton, N. Y.

Mercury Mfg. Co., Chicago, Ill.

COMBINATION TRUCK AND TRACTOR

Exporter Wants Vehicle to Carry 1 Ton and Haul 4 Tons in Trailer

To the Editor, COMMERCIAL VEHICLE:

We are interested in a type of motor truck or tractor with a short body capable of carrying about 1 ton on its own chassis and of towing an additional weight of from 3 to 4 tons. Will you be kind enough to suggest the names of a few manufacturers making such a vehicle so that we might get in touch with them and secure the necessary information?—V. PINTO, Russian-American Commercial & Industrial Co., New York City.

So far as known, no vehicle exactly conforming to these specifications is built at the present time, although it is believed that any standard 2-ton chassis would serve. A short wheelbase could be specified and a 1-ton body applied together with a suitable towing attachment to fit the drawbar of the trailer to be used. A somewhat lower gear-ratio would be required and perhaps the next size larger tires for the rear. If difficult road conditions are to be encountered a four-speed gearbox would also be desirable.

USE OF TWO-BEARING CRANKSHAFTS

Twenty-one Truck Makes on American Market So Provided

To the Editor, COMMERCIAL VEHICLE:

Will you please furnish me with a list of the names of motor trucks which use engines with two-bearing crankshafts?—W. C. METCALF, Willoughby, Ohio.

From data published in the specification table of American motor trucks as published in the November 1, 1916, issue of THE COMMERCIAL VEHICLE the following makes of trucks have one or more models with engines employing two-bearing crankshafts:

Atlas	Overland
Autocar	Packet
Brinton	Rainier
Briscoe	Rush
Corliss	Selden
Croce	Sullivan
Denby	Tiffin
Ellsworth	Universal
Geneva	White
Lane	Wichita
Maxwell	

JONES SPEEDOMETER PARTS

To the Editor, COMMERCIAL VEHICLE:

Can you advise me where to secure parts for the Jones speedometer?—W. W. FAX, Malone, N. Y.

Parts for the Jones speedometer may oe obtained from the H. W. Johns-Manville Co., Bush Terminal, Brooklyn, N. Y.

HOW TON-MILE IS FIGURED

Discussion of Methods of Computing Unit of Motor Truck Work

To the Editor, COMMERCIAL VEHICLE:

Is there any established method in use by the S. A. E. or any other organization for figuring the ton-mile of the motor truck? If not, would you kindly supply us with the method used in your department?—W. D. RIGHTMIRE, director of sales, Winther Motor Truck Co., Kenosha, Wis.

There are but two methods of figuring ton-mileage which deserve the dignity of being called standard. The first is the universal unit employed by engineers generally and computed in the same manner as foot-pounds, kilowatt-hours, etc. The second is what THE COMMERCIAL VEHICLE has named the *commercial* ton-mile, which has nothing to do with the mechanical unit or, as it may be called, the *absolute* ton-mile, being intended for a totally different purpose, namely, the measuring of commercial work accomplished by a motor truck.

The absolute ton-mile is not suitable for commercial computation and is only valuable in engineering or scientific work. It is useless for cost computations for the reason that it gives no measure of useful work accomplished. In delivering a load of goods from one point to another and returning to the first point for another load a truck is doing useful work every minute that the wheels turn. By the absolute ton-mile figure it would appear that it was only working while it was carrying a load, and in figuring costs it would appear that there was a tremendous waste in having the truck return empty. This, however, is not the case, for the peculiarities of the installation may be such that only a one-way load is possible, the empty return being quite as much a necessary part of the delivery as the loaded trip out.

Furthermore, in cost computations it will be found that in the cost of operating a truck there is little or no relation to the absolute-ton-mileage performance since it costs nearly or quite as much, and in some cases more, to operate a truck without a load as with a load.

The commercial ton-mile, on the other

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hand, gives a result which is calculated by multiplying th- total tonnage delivered by the total miles traveled on each trip, since it is of no commercial importance whether a 5-ton truck carries 5 tons 1 mile and 1 ton 4 miles, on a given trip, or 5 tons 4 miles and 1 ton 1 mile, so long as 5 tons total are delivered in a run of 5 miles. Similarly, it matters not how much of the return mileage is made under a full or partial load and how much is made empty so long as the delivery of the load taken out necessarily entails that amount of total mileage.

Conversely, however, it readily reveals the economy of return loads where these are possible, since delivering a load in both directions with, according to the formula for commercial ton-mileage, doubles the resultant figure.

The absolute ton-mile is furthermore highly impracticable for use in ordinary work because of the great difficulty of figuring it accurately. Taking, for example, a truck which is delivering, say, wholesale groceries over a route of 10 miles per trip, total mileage. Assuming such a truck to start from the warehouse or store with 5 tons, it may run 2 miles and then deposit 450 lbs. A ½ mile further on it may deposit 900 lbs. and ⅝ mile further on it may deposit 2 tons, and so on, toward the last of the trip making a return empty run of 2⅓ miles.

To determine the absolute ton-mileage of this run would require a separate computation for each stop and the totaling of the results. A very slight change in the distribution of this load, although the same amount of goods might be delivered and the same number of miles run, would make a considerable difference in the result. Such a difference would have no commercial significance whatever and might be decidedly misleading.

Obviously the truck operator who wishes to keep an account of his ton-mileage cannot hope to do so by the absolute method. Indeed, it would be difficult even if he went to the expense of putting a special clerk on each truck to check it up, for it would then be necessary to weigh each article when it was unloaded from the truck.

As an attempt to overcome these difficulties it has been the custom for some people to roughly estimate that an average truck runs half the time empty, or, in other words, that its average load is about half its capacity, and so compute ton-mileage by multiplying the total mileage by half the tonnage or the total tonnage by half the mileage. Obviously this method of figuring ton-mileage is wholly unscientific and inaccurate, as has been pointed out in an article entitled, "What the Ton-mile Is and How to Figure It," as published in THE COMMERCIAL VEHICLE of April 15, 1915.

Instead of either of these methods, THE COMMERCIAL VEHICLE has adopted the commercial ton-mile for use in its Standard Cost System for Motor Trucks. The only data necessary to figure commercial ton-mileage are the total amount of goods delivered and the pick-ups, that is, the total load taken from the starting point plus the total picked up along the way and delivered, either on the route again or at the starting point, multiplied by the total mileage on that trip. A record of this is usually kept by careful business houses, and, if not. can be without any additional expense or any difficulty.

Of course in some classes of work the ton-mile does not suit, such as in delivering bushels of grain, barrels of beer, cans or cases of milk, boxes of biscuit, etc., in which it may be preferable to use the package-mile in which the number of packages becomes a factor in place of tons of weight delivered.

TRUCKS FOR LOGGING AND LUMBERING

Timber and Mill Work Being Done By Commercial Vehicles

To the Editor, COMMERCIAL VEHICLE:

If you have any statistics in regard to work done by motor trucks in the lumber and mill work line, I would appreciate your referring me to same. I had quite a bit of this information and other in my file of COMMERCIAL VEHICLES for the past 18 months, but loaned it to a friend of mine and they were destroyed when his house burned down.

I would very much appreciate your letting me have what information you may have, as it will help me quite a bit in closing two or three deals in Little Rock.—L. C. COHN, Southwestern Supply Co., Little Rock, Ark.

While THE COMMERCIAL VEHICLE does not aim to keep statistics on trucks in use in the different industries, several articles have appeared recently relative to the efficient use and the field of motor trucks in logging and lumber work. The two most prominent of these are:
August 1, 1916, page 18.

"Trucks Oust Horses in Logging Work," 2 pages with illustrations. Here is recorded the work of Machias Mill Co., Woodinville, Washington, with 4-ton Riker trucks, using a lumber dolly or trailer to haul long logs from the forest to Lake Samamish, from where they are floated to the mill.
January 15, 1917, page 5.

"Lumber Trade Keeps Pace with Building Development with Trucks," 3 pages with illustrations. This article, by J. Crow Taylor, deals with the entire industry in an analytic way, pointing out the magnitude of the business, the proportions and importance of its transportation problem, and outlines the various fields of motor trucks and their manner of use.

HOW FAR SHOULD WARRANTY GO?

Governor Maker Wants to Be Fair, But Fears to Go Too Far

To the Editor, COMMERCIAL VEHICLE:

We are a new concern manufacturing a precision speed governor for motor trucks. Our terms of sale are f.o.b. our factory, and the guarantee with which the governors are sold is that they shall be free from defective material and workmanship and that any repairs which may result from these causes will be done free of charge any time within thirteen months from date of purchase, provided "the material is returned to our works free of all carrier charges."

Several of our customers have objected to this clause, and we wish to inquire if in your mind it is a legitimate one, and if it is followed out by other concerns in our particular line or other automobile accessory lines. We wish to be entirely fair to our customers and follow out the practices of others, and therefore ask for any advice you can give on the subject.—WALTER WEISS, Duplex Engine Governor Co., Brooklyn, N. Y.

The Duplex governor guarantee is more than ordinarily liberal in that it extends for 13 months. The standard warranty on complete vehicles is for but 90 days. The clause which provides for free replacement of defective parts but which does not provide for free transportation is certainly not entirely fair, nor is it entirely unequivocal, since it does not state who is to decide as to whether the fault in a repaired governor is due to defective material or workmanship on the one hand, or improper application, damage or abuse by the user on the other. The standard guarantee used by most parts, accessory and vehicle manufacturers places this up to the judgment of the manufacturer.

There are radicals who urge that a guarantee of merchandise should be a simple warranty of satisfaction by the purchaser, thus protecting him against design faults as well as faults of manufacture, providing for the refund of the purchase price or other adjustment satisfactory to the purchaser, on demand.

Obviously, however, the best guarantee is a good reputation and a consistently fair sales and service policy. If a guarantee is to be given at all, it should either be the full warrant of satisfaction or the purely formal one which puts the matter entirely up to the manufacturer. The latter type, which is prevailing, has no real value, and is merely a form, but if a concern conducts its business properly it will adjust all legitimate claims by purchasers irrespective of the guarantee and to the satisfaction of all parties concerned.

The only other guarantee on a governor known to THE COMMERCIAL VEHICLE is substantially like that of the Duplex company, except that it covers 1 year instead of 13 months.

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Special Bodies for War and Business Tasks

Route Marker, Grocery Store and Army Office on Wheels

Complete Office Equipment On New Army Truck

GREAT mobility and the ability to move forward or backward quickly in case of an advance or a retreat as the case may be, are the outstanding characteristics of a new type of office car for the commander of an army. It is further featured by the completeness of its equipment which includes all the modern conveniences of an up-to-date business office. The first body of its type was recently mounted on a White 1½-ton truck sold to the National Guard of New York and saw some service along the Mexican border where it may again prove of great value should the expected trouble with Mexico materialize as a result of our declaration of war against Germany.

The body, shown in the two accompanying illustrations, is provided with a permanent top, two side doors and low panel sides aft of the doors with roll curtains to inclose the sides in case of snow or rain. Beginning at the front, there is a complete roll-top desk extending clear across from side to side. This desk has various sizes of pigeon-hole drawers for filing reports, documents or index cards for various purposes. Above the pigeon holes are several long open compartments or bins in which drawings, maps and other bulky papers are filed. The lower portion of the desk is provided with three compartments for three typewriters which can be drawn out on slides and manipulated from the front of the desk. When the typewriters are not in use, the conventional writing shelf of the desk may be dropped down.

The desk may be reached from either side of the truck through a permanent step suspended from the truck frame and from a side door hinged from one of the body uprights and provided with a glass panel in the upper half. The closed portion of the door below the glass on the inside is utilized for four wire racks, much like letter baskets used in the modern office, in which papers for the various army units are held until delivered.

In the center of the body aft of the desk, and extending clear aft to the rear tailgate is a removable table supported on two uprights. This is used to examine drawings, maps and other important papers which may be laid out flat and viewed from either side of the table, the officers sitting on seats hinged to the low-sided panels. These seats will accommodate six persons, and if necessary, the commanding officer and his staff may transact business while the truck is in motion.

A telephone, operated by the encampment electric equipment, forms a part of the outfit to enable the officer to communicate with any of his subordinates at will. A swinging bulletin board attached to the left door stanchion is another interesting detail. A shelf of the same length and height as the low-sided panel is hinged to the latter on the outside and may be swung downward to form a desk on which officers may make out their reports without entering the truck.

The body is exceptionally light due to the glass doors on each side, the roll-up curtains and to a series of fixed glass panels somewhat similar to the ventilator windows on a railroad passenger coach near the top of the body on each side. At night, or when the side curtains are all down, the interior illumination is aided by two electric ceiling lights operated from current secured from the vehicle storage battery.

The truck is provided with front and side curtains on the driver's cab so that it may be completely inclosed if the vehicle remains stationary for any considerable period. Another detail of construction which should prove valuable in army service is a large tool and repair-parts box on the runningboard under the body at the front end as shown.

Route-marking Crew of Six Can Sleep in Truck Body

LIKE the camel who invades distant desert stretches well prepared with 7-days' water supply, the novel body mounted on a Federal truck owned by the California Automobile Assn. enables the vehicle to travel 500 miles without the renewal of engine supplies and without the necessity of the crew of six men sleeping in hotels, were there any in the northern part of California and Nevada in which the truck is used in marking and charting roads.

The truck is equipped with a permanent top with roll side curtains and a double floor between which are carried various forms of road-marking signs, sleeping equipment such as blankets, pillows, etc. The six men in the crew sometimes employed sleep on the top floor, lowering the side and end curtains to protect them from the elements during inclement weather.

The signs and sleeping equipment are not removed from the space between the floors from the inside, but from the outside as shown in one of the accompanying illustrations. This is accomplished by means of five small doors hinged to the edge of the floor on both sides. These open outward and downward and permit easy access to the material inside.

Due to the fact that the truck must be virtually self supporting during its trips in the outlying districts, it must carry the maximum number of repair parts and tools. These are carried in long repair kit boxes supported on the rear end of the front wheel fender or short runningboard at the front and on a bracket just forward of the front end of the rear spring at the rear. An extra large gasoline tank is provided under the driver's seat and additional water tanks are carried on top of the tool boxes on each side.

Grocery Store On Wheels Gets Rural Business

CARRYING the country grocery store to the farmer instead of making him come to town to buy, the unique body shown on the accompanying 2-ton Reo truck is a complete grocery store on wheels. It is owned by E. E. Moseley, Pine Bluffs, Ark., who orginally used it in a 15-mile circle from Pine Bluffs, but who has been forced to reduce the area served to that included within a 5-mile zone because of the popularity of the service and the necessity of making over 100 stops per day.

The groceries carried in the truck are sold on the cash basis and are bought, paid for and delivered at one time. The vehicle starts out on its daily route stocked with goods which experience has taught can be sold. It pulls up outside of the customer's house and the driver rings a bell mounted on the left side of the windshield as shown in the accompanying picture. This notifies the customer that the truck has arrived so that the driver does not have to go to the back door to tell the housewife that he is there. She goes out to the truck, where the driver delivers her order direct.

The body is divided into two main parts, that for the driver and that for the store proper. The former is entirely enclosed and is provided with a full-length door on the right and adjacent glass panels. The driver walks into the store part of the body from the cab through a usual-sized door in the center of a partition separating the two. At the extreme rear there is a customers' vestibule separated from the remainder by a railing with a wide counter on the top.

Leading forward from the counter to the partition dividing the grocery and driver's compartments there are two narrow shelves, one on each side, with bins above and below in which various kinds of package goods are carried. At the extreme rear, at the right, is a top-lift ice box which forms a part of the counter when the top is down. In it are carried meats, butter, milk and other perishable goods.

The goods carried in the bins is kept from falling out while the truck is in motion by means of small rods pivoted at one end and supported in a U-shaped clip at the other. As the goods are taken out by raising the bars, the latter drop back into place without further attention.

Outside of the body under the rear are two chicken coops with hinged swing-back bottoms. Two tanks are also carried at the rear for kerosene and gasoline.

The truck is equipped with an electric starting and lighting system, the current being used to light three electric ceiling lights in the body and to operate the bell used to announce the arrival of the truck so that the housewife has time to get her list of purchases and purse ready. The body is heated in the cold months by a utilization of the engine exhaust.

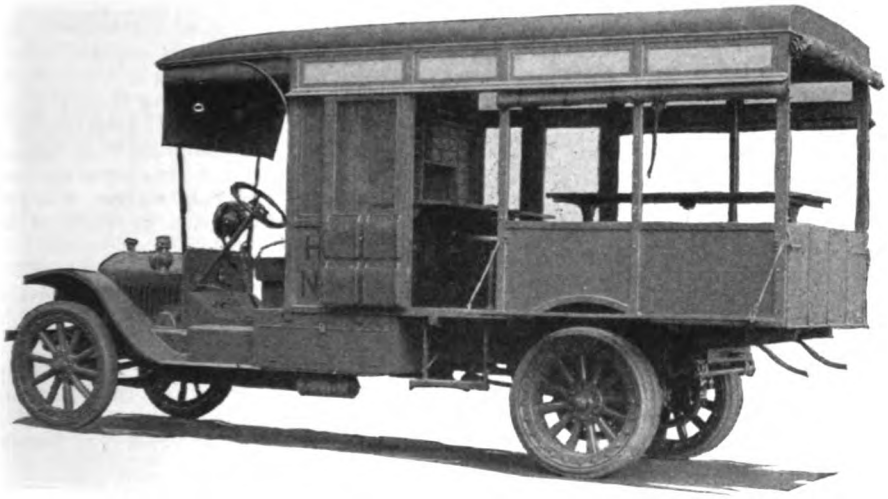
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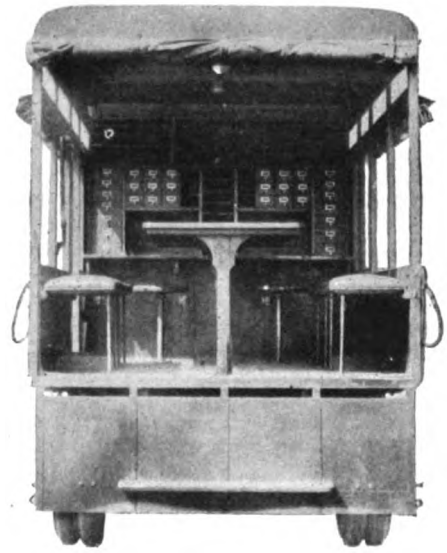
A detail of one of the side lockers showing the ease by which the road markers can be taken out without getting into the truck body. The hinged doors swing upward and are locked in place



The Federal used by the California Automobile Assn. for marking and charting roads in northern California and Nevada. It can travel 500 miles without replenishing its supplies of water, gasoline and oil. Its crew of six men can sleep in the high-sided body and use the side curtains for protection

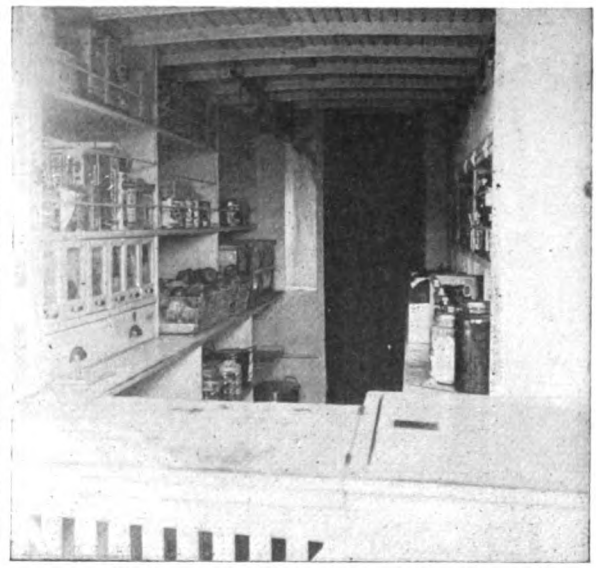


A new type of office car for the commander of an army. It is equipped with all the furnishings of the modern business office including a roll-top desk, typewriters, telephone, chairs, wire letter baskets, a bulletin board, a good-sized collapsible table and sufficient chairs. Note the extra hinged side panels which may be swung downward on each side to form desks on which subordinate officers may make out their reports without getting into the truck body



Rear view of the officers' truck showing the roll-top desk, fold-down seats, center table, ceiling electric lights and small glass panels on each side near the body top to give better interior lighting





Side and rear view of the latest type of grocery store on wheels. Note the electrically-operated bell on the windshield bracket in the view on the left. It is used to notify the housewife that the truck has arrived so that she may have her purse and order ready. Note the interior shelving and the top of the ice box at the right

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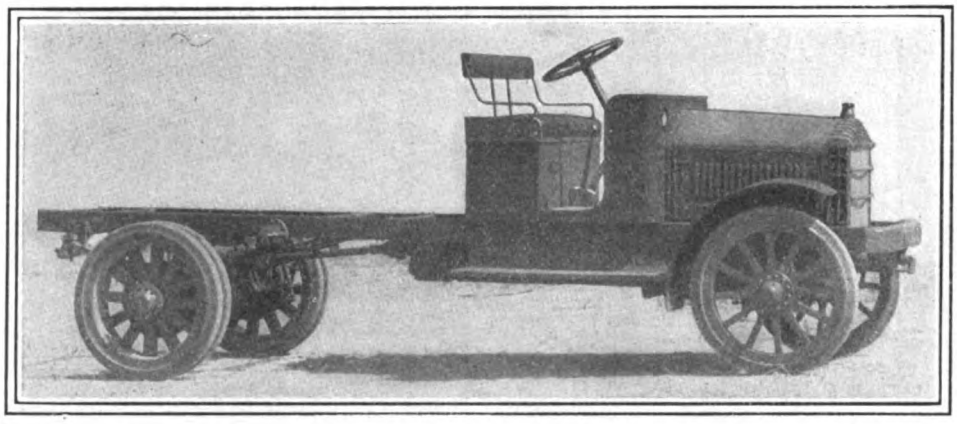


Fig. 1—New Garford 2-tonner, showing improved radiator

New Garford Road-builder and 2-tonner Produced

Garford Principles Continued With Refinements

TWO new models in the line of the Garford Motor Truck Co., Lima, Ohio, have recently been added. These are of radically different types, the first being a re-designed 2-tonner, known as the 70B, and the other the new Garford road-building truck. The latter is a tractor-truck designed to haul 6 tons of material in its dumping body and to haul trailers or tow road machinery.

The latter vehicle is intended expressly for road-building work, having broad steel tires and an exceptionally low gear-reduction secured by the use of a worm-driven jackshaft and final chain drive. The truck follows previous Garford practice in heavy trucks in that the engine is between the seats with the radiator in the middle of a steel roman dash. The radiator is of the new finned-tube, cast-metal-incased type recently adopted by the Garford company.

GARFORD SPECIFICATIONS

Capacity, lb.	4000
Price	$2,600
Wheelbase, in.	142*
Tires, front	36x4
rear	36x4d
Bore, in.	4¼
Stroke, in.	5½
N. A. C. C. hp	29
Speed, r.p.m.	——
m.p.h.	——
Gear-ratio in high gear	——
Final drive	worm

*166-in. wheelbase $100 extra.

The engine is of the standard Garford type, built by the Garford company, and drives the jackshaft through a four-speed gearset with direct drive in top speed. The jackshaft is really a Timken worm-driven axle, but is secured to the frame by heavy cast steel brackets, which also carry the front ends of the radius rods, the front sprockets taking the place of wheels on the jackshaft ends.

All four wheels are of cast steel, the rear ones being of the cruciform type, which combines great strength and rigidity with light weight. Provision is made for the application of a center rib to the front tires and herring-bone or V-shaped cleats to the rear ones, for operation in soft ground, such as the sub-grade of a new road. These may readily be detached for use on paved surfaces, in which case the broad steel tires act somewhat like road rollers.

The body is of steel, equipped with a hydraulic dumping gear, set low on the frame so as not to increase the overall height of the truck above the cab roof and a tailboard control by which its opening may be regulated to permit crushed stone, etc., to be spread by the truck as it moves along.

The towing feature consists of two interchangeable drawbars, one of the spring type for use in hauling trains of trailers and another of the rigid form for use in pulling plows, scarifiers, graders, scrapers and the like.

One of the features of the truck is its short wheelbase—but 128 inches. This is attained by virtue of the between-seats engine location. In passing it is well to note that the production of such a vehicle by the Garford company is a highly appropriate thing, for this concern has been a long and earnest worker for improved roads as a means to transportation economy.

Though it does not radically differ from older Garfords in any essentials of construction, nevertheless the new 2-ton 70B model embodies a number of interesting new features. These were fully described in THE COMMERCIAL VEHICLE of March 15, 1917, on page 23, so they need only be briefly reviewed here.

The new ideas center about the front and rear ends. In front the first thing which strikes the eye is the new radiator. This is of the cast-case finned-tube type,

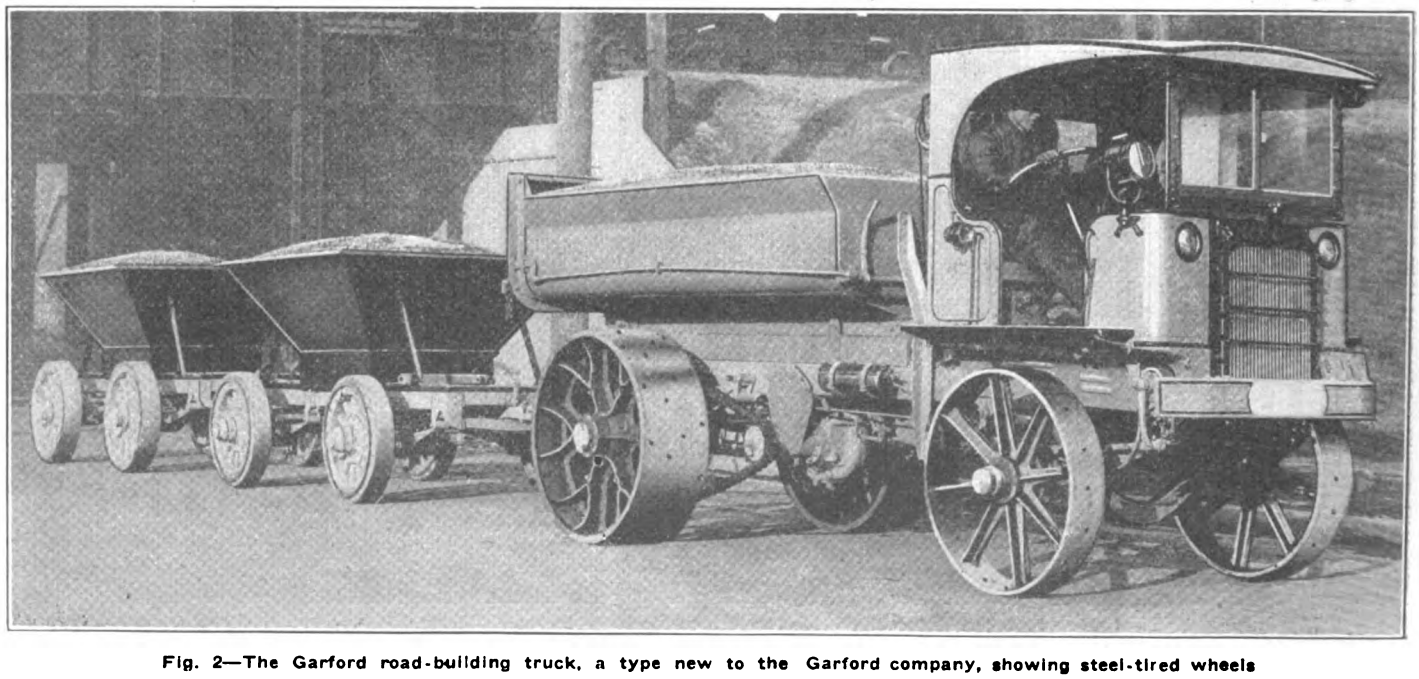


Fig. 2—The Garford road-building truck, a type new to the Garford company, showing steel-tired wheels

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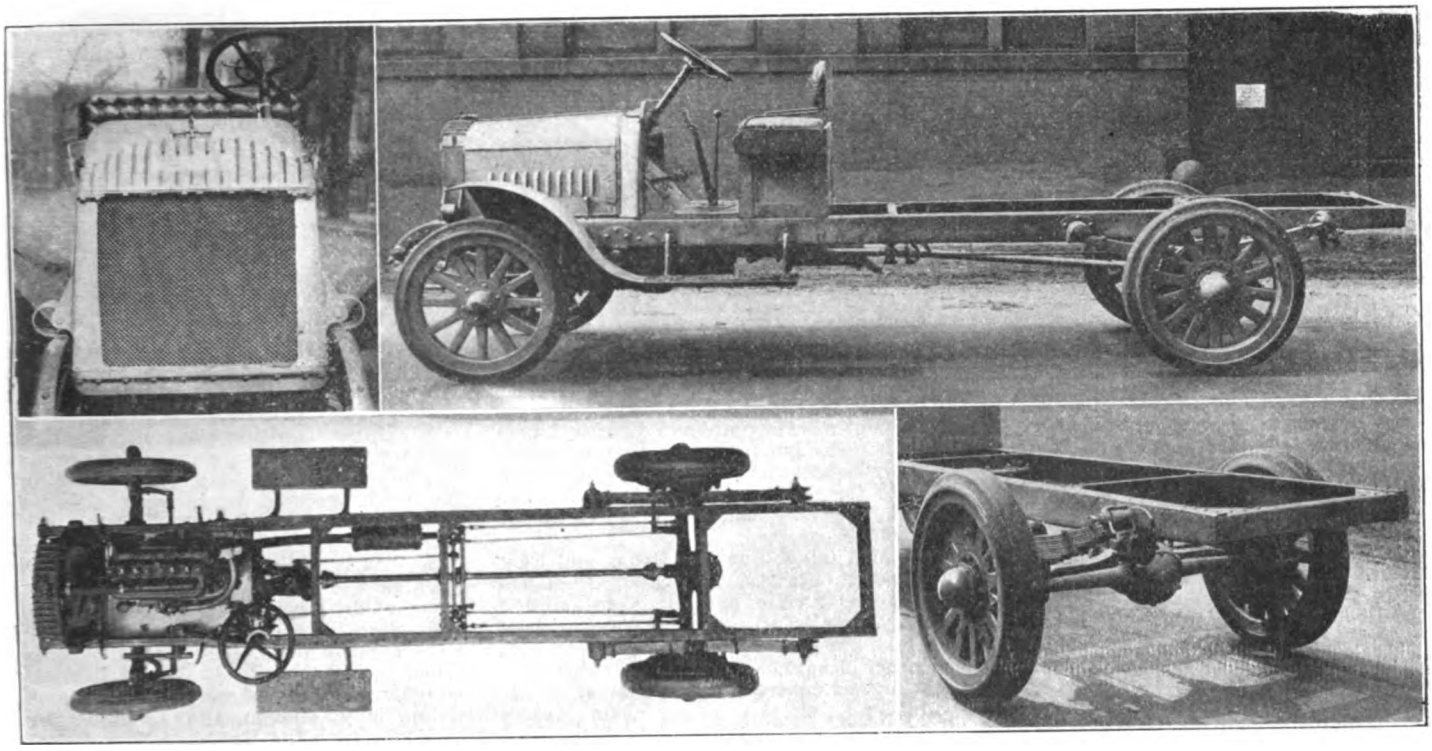


FIG. 3—THE MASTER TRUCK FROM SEVERAL POINTS OF VIEW

Above, left, the front end is dominated by the cast-case radiator
Below, left, plan view, revealing the simple layout of parts
Above, right, side view of the chassis showing conventional lines
Below, right, from behind one glimpses the internal-gear axle

built up and bolted together, the core being made up of helically-finned tubes set vertically. Protection to the radiator in case of a collision is afforded by steel bars across the radiator and a channel steel bumper across the spring-horns.

In the rear system, the Garford company has adopted means to insure the success of the Hotchkiss drive, which it employs. As the rear spring is the vital element of the Hotchkiss method of drive, its anchoring to the frame, both at the front tip and the middle, has been safeguarded.

At the front end of each rear spring is a triple-pinning arrangement by which both the top and second leaf are provided with eyes, one retained by a fixed pin and the other by a swinging one, a third pin below these serving to hold the triangular sideplates together by which the other two pins are retained.

At the middle of the spring, besides the usual double clips, is a third clip formed of the filler block on top of the spring and a plate inserted between the spring and its perch to compress the middle of the spring independent of the axle.

The truck has a conventional block-cast engine beneath a European hood provided with louvres, a three-speed selective gearset mounted amidships and final drive by a worm axle. It has right drive and central levers and the characteristic steel roman dash with the lamps set flush in its front portion.

Truck Profits Depend on Good Repairs
See Pages 26 and 27

Master, a New Chicago-built 2-ton Vehicle Out

One Conventional Chassis to Be Sole Product

MASTER SPECIFICATIONS

Capacity, lb.	4000
Price	$1,890
Wheelbase, in.	144*
Tires, front	34x4
rear	36x6
Bore, in.	4¼
Stroke, in.	5½
N. A. C. C. hp.	29
Speed, r.p.m.	——
m.p.h.	——
Gear-ratio in high gear	——
Final drive	internal gear

*168-in. wheelbase $60 extra.

CHICAGO built, Master trucks are at present produced in but one capacity—2 tons. They are a recent addition to the roster of the industry, being produced by Master Trucks, Inc., of which Eugene Goldman, former Republic distributor, is president.

Mechanically, the vehicle is conventional, having the unit power plant under the hood forward and shaft drive. Its principal features are simplicity achieved by compact grouping of the parts, direct suspension of the Buda powerplant from the main frame and Hotchkiss drive. The frame, of pressed steel, is of the semi-flexible type, permitting the rear springs to be somewhat flatter than ordinary.

Cylinders of the engine are cast in block, with valves to the right. Centrifugal pump water circulation is employed, the radiator being of the cellular type in a cast iron casing. This radiator is supported on crescent-shaped leaf springs to prevent stressing the radiator at times when the frame weaves in traversing rough ground.

A Master carbureter is fitted, incorporated with a Monarch suction governor and fitted with a dash adjustment. Fixed spark advance is used in the Bosch single magneto.

The clutch is of the dry-disk type, driving a three-speed selective gearset, from which the drive is transmitted through a two-part shaft to the Torbensen internal-gear-driven rear axle. This shaft has three universals and a central support from the frame supplied with a self-aligning ball bearing.

Hand brakes are internal in the wheel drums, the foot brake acting externally on the same drums. Standard tire equipment is with 6-in. singles in the rear, but 4-in. duals will be supplied at extra cost.

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Men and Makers

STUDEBAKER CORP. has moved its sales and advertising departments from Detroit to South Bend, Ind.

General Motors Truck Co. has opened a factory branch in San Francisco, Cal. This branch is in the charge of W. B. Cochran.

Martinez, Castro & Co., Havana, Cuba, will distribute U. S. trucks in Cuba and Isle of Pines.

A new Mackbuilt Truck Agency in eastern Massachusetts has been placed with J. B. McMahon, Jr., and N. B. Wallis of Cambridge, Mass., who also handle the Redden truck adapter.

Atelliers Atlas, Paris, France, distributor of U. S. trucks in France, has sent M. Gaston Vidie to this country to confer with the factory executives to secure an additional allotment for commercial purposes only.

An agency for Peerless trucks has been placed in Worcester with Frederick C. Chandler, formerly a Cadillac salesman.

Findlay Steel Castings Co., Findlay, Ohio, has purchased the former home of the Grant Motor Co. for the manufacture of motor vehicle castings. The company is capitalized at $200,000. E. J. Edwards is president, E. G. Pelton is secretary; and Dr. C. H. Gage is chemist.

Mott Wheel Wks., now in Utica, N. Y., will be in operation within 60 days at Jackson, Mich. This will bring the Perlman part of the Mott Wheel Wks. to Jackson also, and that will be added to the Perlman Rim Co. plant in that city. The balance of the $80,000 needed to bring the Mott plant to Jackson was raised early this month. It is reported that arrangements have been practically completed through the courtesy of the Briscoe Motor Corp., by which that company will surrender the former Ames-Dean plant on Wildwood Avenue to the new corporation.

Deshler Auto Spring Wheel Co., Deshler, Neb., has been organized with a capital of $100,000. The company will manufacture a steel spring motor vehicle wheel patented by W. Nance, who is president of the company. Gregor Langs is vice-president; H. Schlamann, secretary-treasurer; and H. J. Strube, director. A site for the factory has been selected and a two-story brick building, 75 by 150 ft., will be erected.

G. Mitchell & Son Co., Cedar and East Sixty-fifth Streets, Cleveland, Ohio, has purchased a site and plans to build a plant to manufacture motor vehicle sheet metal parts. It will cost about $250,000.

Bosch Magneto Co., Springfield, Mass., has signed contracts with Kleiber & Co., San Francisco, Cal.; Bethlehem Motors Corp., Allentown, Pa., and with the Larrabee-Deyo Motor Truck Co., Binghamton, N. Y., to use Bosch magnetos during the coming season.

Hartford Auto Parts Co., Hartford, Conn., maker of universal joints and cone clutches, has taken space in the N. Y., N. H. & H. R. R. building. This will give it about 125,000 sq. ft. of space.

Waukesha Motor Co., Waukesha, Wis., is installing a complete automatic sprinkler system of fire protection throughout its plant. The cost of the improvement is in excess of $20,000.

Hood Rubber Co., Watertown, Mass., is erecting a large addition to its plant, to take care of its growing business and arrange for a production of 2000 tires a day. The new structure under way will provide for 80,000 sq. ft. of floor space and it will allow for a continuous working plan of 24 hr. At present the company turns out 300 tires a day, but this will shortly be jumped to 900 and then eventually to 2000.

Champion Ignition Co., Flint, Mich., maker of A C spark plugs, has contracted for another story to one of its factory buildings, which will give an increased floor space of 10,000 sq. ft. This is the third addition within 18 months. The floor space 1½ years ago was 27,000 sq. ft.; to-day it is 80,000 sq. ft.

Champion Ignition Co., Flint, Mich., has completed arrangements to turn out 80,000 spark plugs daily and buildings are being erected to increase this capacity in the near future.

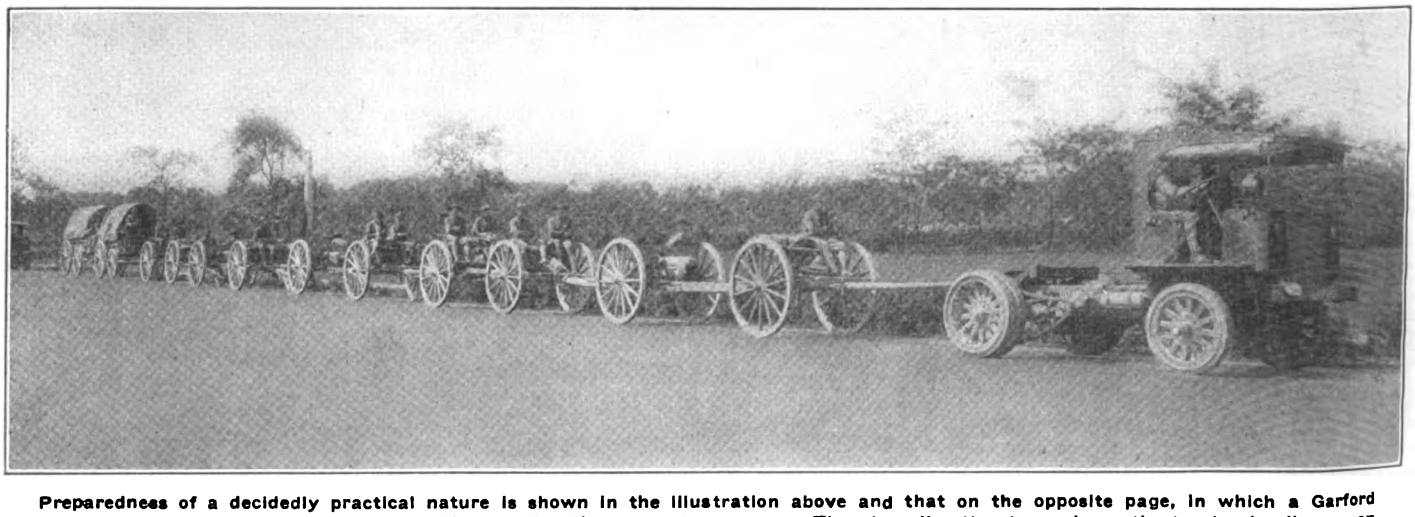
Goodyear Tire & Rubber Co., Akron, Ohio, has established classes in military training for its employees, affording 2 hours of drill each week for each shift.

Sterling Tire Corporation has opened a new branch at 5018 Euclid Avenue, Cleveland, Ohio. J. J. White, formerly manager for the company in New Haven, Conn., is in charge, and J. H. Burnet, formerly with the Herdman Tire & Rubber Co. of New Jersey, is assistant manager.

Goodyear Tire & Rubber Co. has announced that it will build a $450,000 clubhouse for its employees, which will be known as Goodyear Hall. This will have an immense gymnasium with seating capacity of 5000, with all stage and assembly hall facilities. There will be a smaller auditorium seating 1400, a swimming pool, bowling alleys, and a rifle range.

Bradford-Ackermann Corp., recently formed by A. H. Ackermann and C. C. Bradford, with offices in the Forty-second Street Building, New York City, has concluded arrangements with Ashton, Laird & Co. for the sole selling rights of the Astra high temperature gas apparatus and oxygen welding appliances.

Robert J. Hathaway has succeeded Sidney S. Merrithew as traffic engineer of the Federal Motor Truck Co., Detroit. Mr. Hathaway has been in charge of sales promotion for the Federal company and takes the new duties in addition to his previous ones, since the two lines of



Preparedness of a decidedly practical nature is shown in the illustration above and that on the opposite page, in which a Garford 10-ton tractor was employed to haul artillery and military supply wagons. The view directly above shows the tractor hauling seven pieces of heavy artillery and two mess wagons belonging to Battery C, Illinois National Guard, from Ft. Sheridan to Grant Park, Chicago, where a great national preparedness parade was recently held. The total weight of the artillery and their caisson and the mess wagons amounted to about 20 tons

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work are linked closely in many ways. Mr. Merrithew, as previously announced, has joined the sales promotion department of the Packard company.

J. H. Kershner has been appointed special factory representative for the Cadillac Auto Truck Co., Cadillac, Mich., maker of the Acme truck. Kershner was formerly with the Dart Motor Truck Co., Waterloo, Iowa. For the Cadillac Co. he will have charge of the Kansas, Nebraska and Colorado territory.

Carl H. Kloo, Jr., has been appointed to take charge of the sales promotion department of the United States Motor Truck Company, Cincinnati, Ohio, and to act as assistant to Forrest J. Alvin, general sales manager. Mr. Kloo, several years ago, was associated with the United States Motor Truck Co., and left to join the National Cash Register Co.

Ten Packard Branch Managers have formed a technical service board. This board meets monthly and discusses ways and means of bettering the Packard service, both on trucks and passenger cars. One step already taken is the standardization of Packard service tools, so that any dealer can for a moderate price obtain the tools best adapted to Packard service. This board was organized by H. W. Drew, the new Packard service manager, formerly with Nordyke & Marmon in the same capacity.

Alfred Reeke, who recently resigned as general sales manager of the Nash Motors Co., Kenosha, Wis., has formed the Alfred Reeke Co., to act as distributor of Jeffery trucks in Wisconsin and upper Michigan.

Fred Cardway has recently returned from a trip through South America in the interests of the Packard Motor Car Co. where he studied the territory, secured orders, and established local representatives.

A. F. Williams, formerly of the truck department White Co., Cleveland, Ohio, has been made New England representative of the Winther Motor Truck Co., Kenosha, Wis., with headquarters in Boston.

F. B. Massey, transportation engineer of the United States Motor Truck Co., Cincinnati, Ohio, and formerly a member of the United States Navy, has been recalled to navy duty.

C. S. Connor has been appointed manager of the Omaha branch of the Studebaker Corp. He was manager of the Chicago branch. J. K. Leander, salesman of the Chicago branch, has taken Mr. Connor's place as assistant manager.

R. D. Maxwell, who has been manager of the Los Angeles branch of the Studebaker Corp., has taken over the territory in and around Birmingham, Ala., and in the future will be the Studebaker dealer in that territory.

F. N. Morgan, formerly wholesale salesman and special commercial car representative of the Studebaker Corp., has been appointed to the position of assistant manager of the St. Louis branch. He succeeds Mr. Schmidt, who is now the Studebaker dealer in Memphis, Tenn.

Benjamin Hanger is now the Studebaker dealer in New Haven, Conn. Mr. Hanger left the position of assistant manager of the Boston branch to take over this territory. R. J. Miller, who takes his place as assistant manager of the Boston branch, had been manager of the E. R. Benson Motor Car Co., of Portland, Me.

O. G. Bennet, who was vice-president of the General Motors Export Co. and later resigned to join the Nash Motor Car Co., is dead of pneumonia.

Eben Luther has been chosen president of the newly-reorganized Vim Light Delivery Truck Co., at Boston, Mass.

A. R. Thompson has been transferred to Boston, Mass., from San Francisco, Cal., to take charge of the New England branch of the Garford Motor Truck Co.

J. B. Cowen, sales manager of the R. E. Taylor Corp., eastern distributor of Gramm-Bernstein motor trucks, has resigned. He was also vice-president and treasurer of the Taylor corporation. Mr. Cowen was given a farewell dinner recently which was attended by many of the company who had been with him throughout his regime.

E. E. Mears has been appointed manager of the Boston Branch of the R. E. Taylor Corp., eastern distributors for the Gramm-Bernstein motor truck, with headquarters at 26 Green Street, Cambridge. He succeeds Elmer F. Twyman, Jr., who became general sales manager, vice-president and treasurer of the Taylor corporation.

J. J. Meade has been placed in charge of the commercial vehicle department of the Dunbar, Sanders & Bowen Co., Boston, Mass., agents for the Krebs truck.

Robert B. Parker has been named general manager of the Alvan T. Fuller organization that handles the Packard trucks and cars in Boston, Portland, Providence, Worcester and other New England cities.

George T. Norris, Columbus, Ohio, has contracted to take the agency for the Maxfer truck attachment for the city of Columbus and Franklin County. Mr. Norris expects his first shipment of truck attachments during the next few days.

Norman Bell, formerly sales engineer in the motor vehicle division of the Lunkenheimer Co., Cincinnati, Ohio, has joined the Norma Co. of America, makers of Norma high-precision bearings, in a similar capacity.

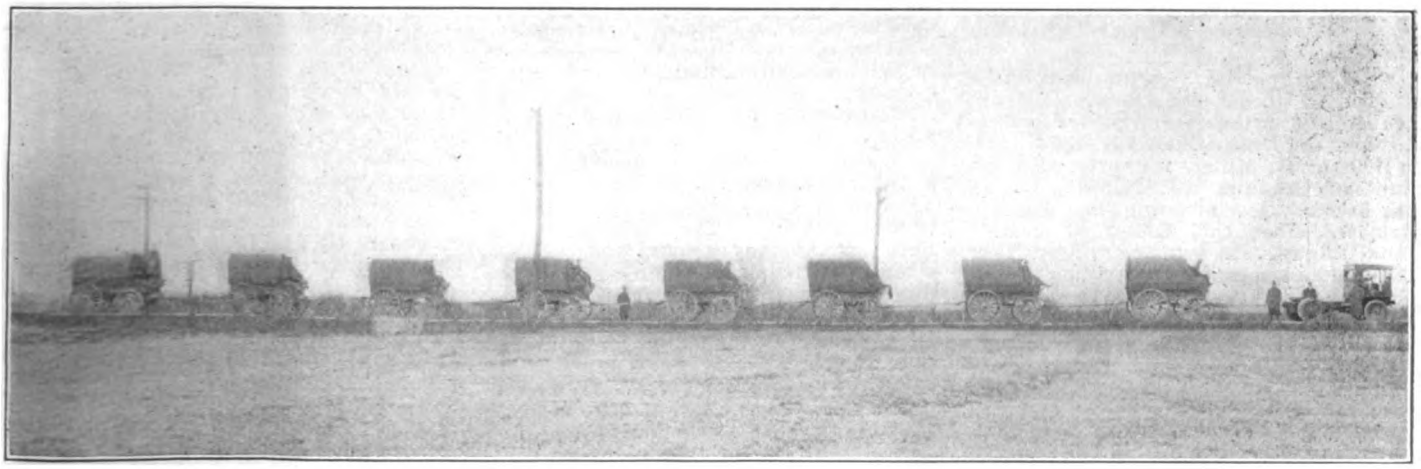
J. M. Schlendorf has been appointed director of sales of the Central Steel Co., Massillon, Ohio. Mr. Schlendorf was associated with the U. S. Steel Corp. for 14 years. For the last 2 years he has been with the Willys-Overland Co., directly in charge of its purchases of special steels and all metals.

L. N. Laupert has been appointed sales manager of the Heinze Electric Co., Lowell, Mass. Mr. Laupret has been with the Heinze Electric Co. for 12 years. He fills the vacancy left open by the death of P. J. Legary.

C. W. Hatch has been appointed sales manager of the Parish & Bingham Co., Cleveland, Ohio, maker of pressed steel frames.

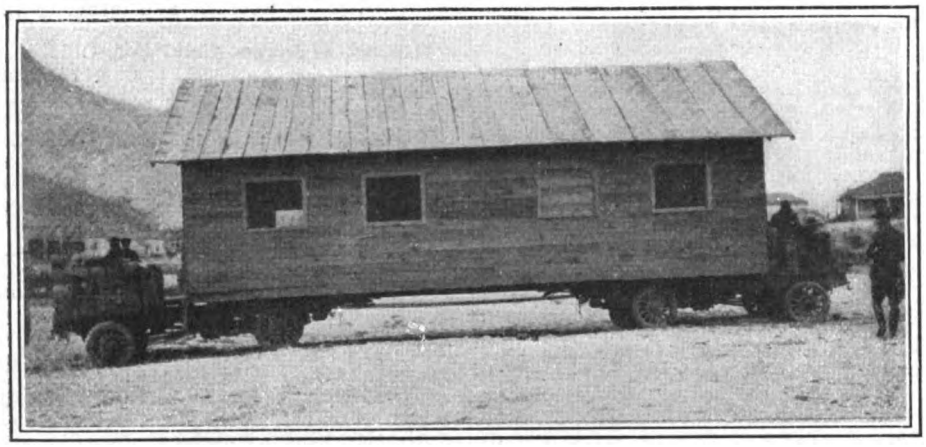
United States Tire Co.'s salesmen and resident managers of the branches in the Detroit district held a conference in Detroit Friday, April 6, which was presided over by W. Solburn Standish, district manager. Among those in attendance were: C. S. Putnam, E. A. Montgomery, W. J. Chisholm, C. T. Day, C. R. Gray, R. E. Cheahan, E. S. Stimson and H. H. Davies, all of Detroit; C. S. Sowers and H. V. Filkins, of Grand Rapids; C. Q. Vaughn, resident manager at Lima, Ohio, and G. H. Wood and W. Wilmington, of the Toledo branch. Considerable enthusiasm was displayed over the wonderful increase in business for the first 3 months of this year, and it was unanimously carried that the year of 1917 would be the most successful that the company has ever enjoyed.

John T. Clinton, manager of the Buffalo branch of the Firestone Tire & Rubber Co., has been sent to Boston to manage the branch there, succeeding D. C. Swander, who has left to join the Motor Parts Co. Mr. Clinton was temporary manager of the Boston branch



A Garford 10-ton tractor drawing eight supply wagons from Ft. Sheridan to the First Illinois Cavalry headquarters, Chicago, during the latter part of 1916. The train was about 200 ft. long and presented a most unusual sight as it traveled along its route. The illustration above was reproduced from a photograph taken just prior to the train climbing Indian Hill. It is the first section of a convoy of thirty similar vehicles drawn by four Garford tractors. Four mules are generally hitched to each supply wagon, so that the one tractor replaced thirty-two animals

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FOUR TRUCKS CARRY ONE HOUSE

One of the most unusual feats ever performed by motor trucks is exhibited above in which four F. W. D. trucks were used to transfer a 20 by 46 ft. building by placing one truck under each of the four corners. To do this it was necessary that the trucks at the rear corners should drive backwards and on reverse gear and that all four trucks should maintain the same speed during the entire trip. Another difficulty which presented itself due to the 20 ft. width of the building was that the trucks could not travel on the roads because of telegraph poles, trees and other obstructions. It was therefore necessary to make the trip across the fields and through the open country, up hill and down, through gullies and ditches. Notwithstanding all these difficulties the house, which was one of the company quarters, erected by the army at Camp Stewart, along the Mexican border was transferred to Motor Truck Park, El Paso, 7½ miles distant, in a little less than 1¾ hours, without having to be dismantled and erected again at its new location

for some months following the retirement of Thomas J. Glenn, 1 year ago.

E. B. Sigerson, C. M. Klopp, J. E. Taylor, M. Orr and W. C. Blake have been promoted in the Goodyear Tire & Rubber Co. service. Mr. Sigerson has left the managership of the Buffalo, N. Y., branch to do special work in the motor car tire department at the home office in Akron, Ohio. Mr. Klopp goes to Buffalo from his position as motor truck tire representative at Syracuse, N. Y. Mr. Orr, formerly at Charlotte, N. C., has been made head of the Syracuse branch. Mr. Taylor, who has been at the home office, has been transferred to Charlotte. Mr. Blake, who has been manager at Syracuse for 6 years, has been advanced to branch manager at New York.

C. P. Brewster has been appointed special factory representative of the Edward A. Cassidy Co., New York. He was formerly in Philadelphia. His new duties will take him through the Detroit factory territory, where he will have his headquarters.

W. H. Kirkpatrick, vice-president of the Wallace C. Hood Service Bureau, Detroit, has enlisted in the quartermaster department of the United States Army.

William H. Miller, formerly with the Acheson Graphite Co., Buffalo, N. Y., has become associated with the Flexible Armored Hose Co., maker of flexible metal tubing. He will cover the eastern and middle western territory.

The Assn. of Manufacturers' Cost and Efficiency Engineers of Indiana has been formed by the cost accountants and efficiency engineers of manufacturing establishments in Indiana. It is the plan of this association to include cost and efficiency men from all factories in Indiana employing more than 300 men. Meetings will be held each month, at which time the work of this department in Indiana factories will be discussed, ideas interchanged and new plans and methods presented and explained. Organization of the association was obtained by the election of Guy E. Sharpe of the Link Belt Co., Indianapolis, as president; C. O. Peek, Nordyke & Marmon Co., Indianapolis, vice-president; F. T. Cullens, Nordyke & Marmon Co., secretary, and H. J. Wilson, Warner Gear Co., Muncie, treasurer. These four men and D. E. Nauman, Remy Electric Co., Anderson; M. P. Witherspoon, National Motor & Vehicle Co., and Charles R. Ogsbury, Tabulating Machine Co., Indianapolis, form the board of directors. Applications for membership are being received by the secretary from all Indiana cities and towns, the constitution requiring that the members must be from establishments employing not less than 300 persons.

A Packard Cruise to Picture Rocks in Lake Superior has been arranged by the Packard Motor Car Co., Detroit, for its dealers and master salesmen of both the truck and passenger car divisions on June 18 to 21. The steamship *Noronic* has been chartered. The cruise is planned as a factor in the Packard's organization-building efforts. Business sessions will be held every morning, afternoon and evening. Addresses on engineering, manufacturing and distribution will be made.

"Lubrication of the Automobile, No. 2—The Chassis" has been issued by the Vacuum Oil Co., Rochester, N. Y., maker of Gargoyle oils. The booklet contains line cuts of the various parts of the chassis and explains their use and the proper method of lubrication.

"Motor Vehicles and Safety" is a booklet published by the Travelers Insurance Co., Hartford, Conn., which takes up in detail the common dangers in motor vehicle driving and how they may be avoided. Special sections are devoted to motor trucks, showing the importance of loading vehicles correctly, the care of tires, garage hazards, and air storage tanks in garages.

"Wichitauk" is the title of a new monthly house organ of the Wichita Falls Motor Co., Wichita Falls, Tex., the initial issue of which has just appeared as the April issue. This number is plentifully illustrated with pictures from various parts of the world showing Wichita trucks and the men who handle them.

"New Departure News" has made its bow as a weekly house organ of the New Departure Mfg. Co., Bristol, Conn. The paper is intended primarily for the employes of the company and contains news of the plant, pictures of the workers' homes, a woman's department, and a wit and humor department.

"The Story of Joseph T. Howell," published by the J. C. Wilson Co., is the record of Mr. Howell's conversion from the use of horse power to the use of Wilson trucks and the resulting business prosperity that came his way. The pamphlet is handsomely printed. It is a novel piece of advertising, readable, and showing clearly the advantages of self-propelled commercial vehicles.

"Suppose This Were Your Garage" is the title of an illustrated booklet published by the Detroit Steel Products Co., Detroit, showing the advantages of Fenestra window sash. It points out that the additional light afforded by window walls of glass and steel will cut down electric light bills and insure protection against fire.

"250100" is the title of a booklet published by the Catalog Numbering System, San Francisco, Cal., which explains with the aid of specimen cards and half-tones the company's method of numbering catalogs.

Four Electric Patrol Trucks are being used by the New York Police Department. These vehicles are capable of making from 100 to 120 miles per day, and at present are averaging about 70 miles daily.

First Place in the Latin-American Tire Market is being obtained by the United States. The state of Sao Paulo, Brazil, imported more pneumatic tires from the United States than from any other country in the first 9 months of 1916. Before this time she had received the most of her tires from Italy, and before the war France was the leader in the Sao Paulo market.

Motor Truck Service Stations in Latin America would greatly aid the sale of commercial vehicles in the southern republics, according to U. S. Government consular reports. Sao Paulo, Brazil, is an example of a city which needs trucks with large engines to travel over its hills and its badly paved streets, yet only a few are in use in that city. The great majority of commercial vehicles have engines of from 20 to 25 h.p., and the owners have considerable trouble with them, due to the difficulty in getting intelligent drivers. The city has an unusually good supply of garages, but a truck service station which carried a large stock of parts would promote the use of commercial motor vehicles measureably.

The U. S. Tire Co.'s pension plan was approved by the directors and went into effect on April 2. According to the plans formulated, every employe, man or woman, who has been in the employ of the company for 20 years and reaches the age of 65, for men, and women 55, will be eligible. The amounts of the pension are calculated at 1 per cent of the average wage during the last 10 years of service, multiplied by the number of years of service. In no case will the pension be less than $240 or more than $5000 a year. It is not necessary for any employe to join any association or to contribute any funds to receive any pension.

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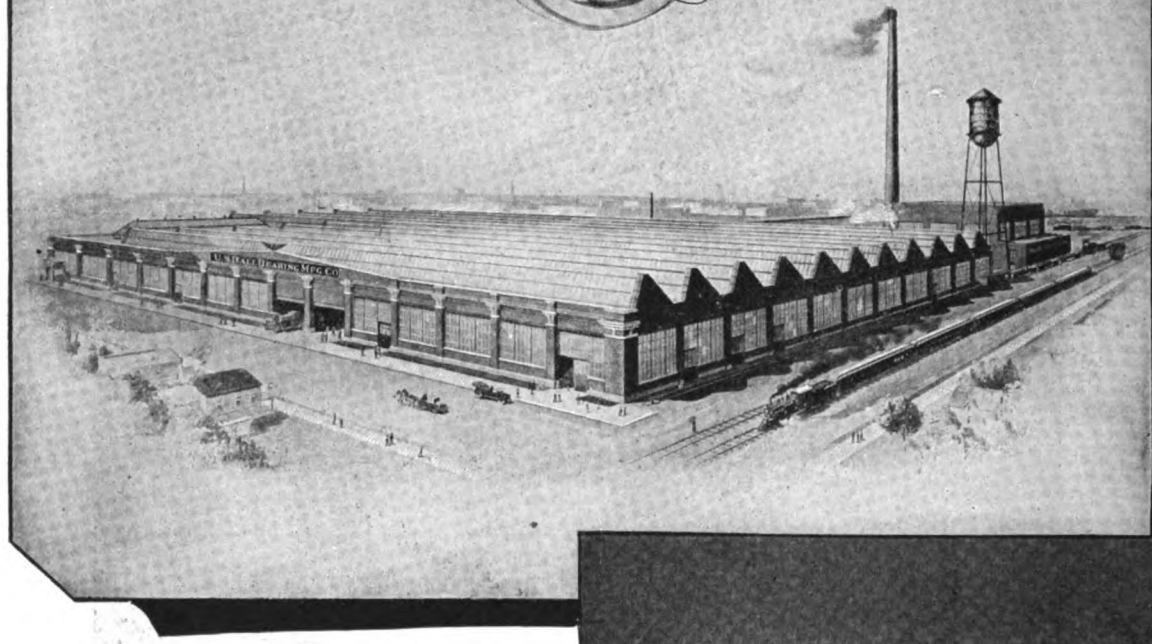
WHITE TRUCKS

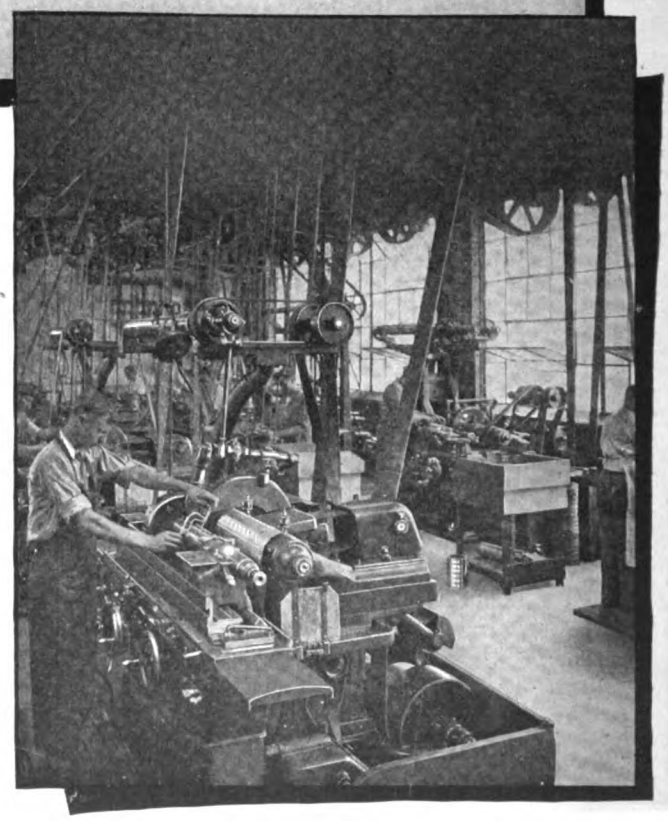
WHAT a truck actually costs is not known until you have operated it for some time. The purchase price is often insignificant when compared with the maintenance and operating bills. The largest users of trucks consider it far cheaper to invest more money in White Trucks and enjoy unfailing service and low expenses over a long period of years — than to buy medium-grade trucks, pay higher bills for less dependable service and stand more rapid depreciation on the investment.

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CLEVELAND

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This Enormous, Modern-Equipped, New Plant is Your Assurance Both of Quality Production and Faithful Adherence to Delivery Schedules.

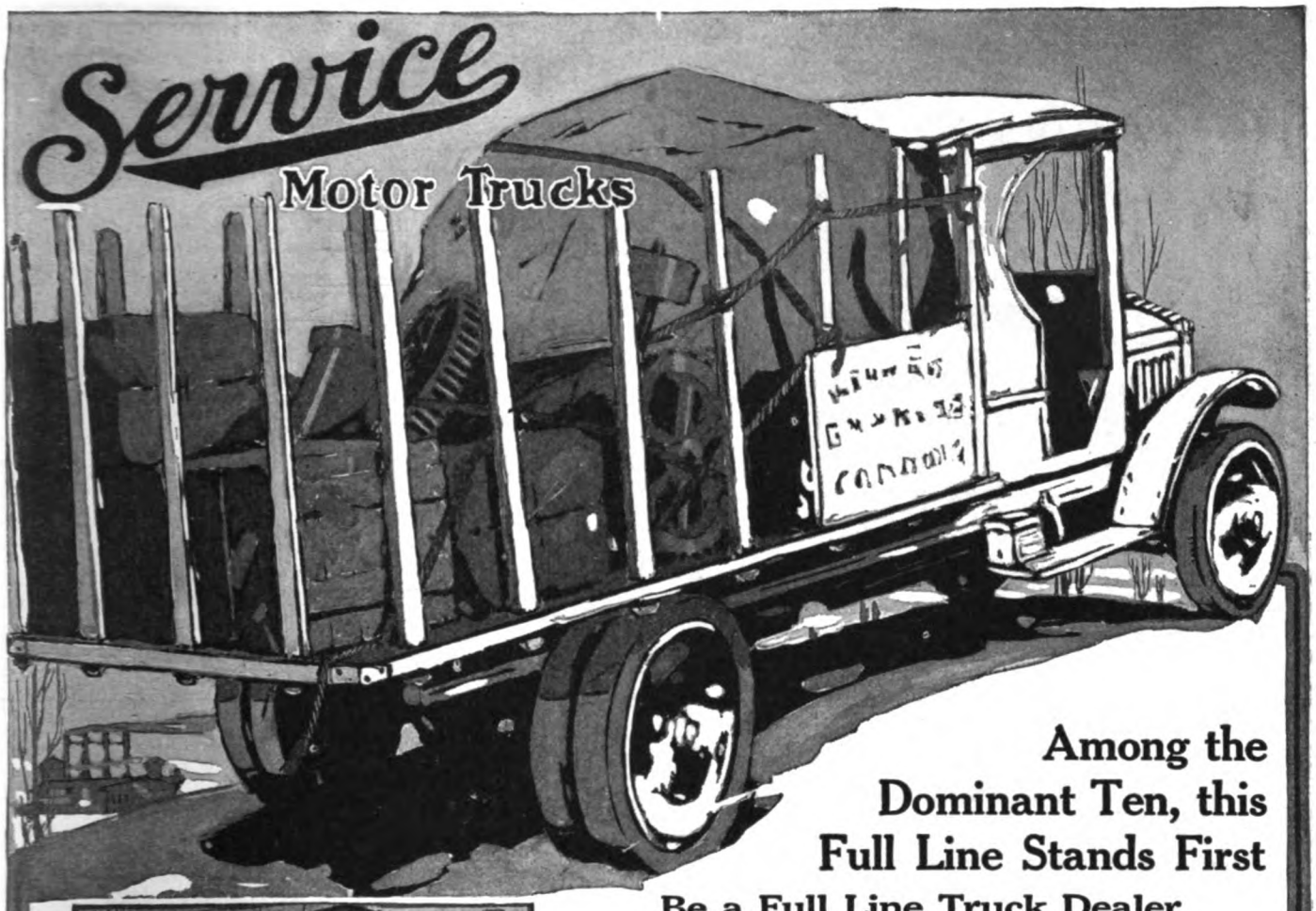
¶ It is important first to remember in connection with U. S. Ball Bearings that only quality bearings are produced in this immense plant—one of the largest exclusive ball bearing plants in the world. This is positive assurance that every user of U. S. Ball Bearings receives only one quality bearing—the highest possible of production—for that is the only kind of U. S. Ball Bearings produced.

¶ In other words in the U. S. Ball Bearings you find the most highly developed and most efficient ball bearings known to the manufacturing world—hence the most efficient anti-friction device obtainable.

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Service Motor Trucks



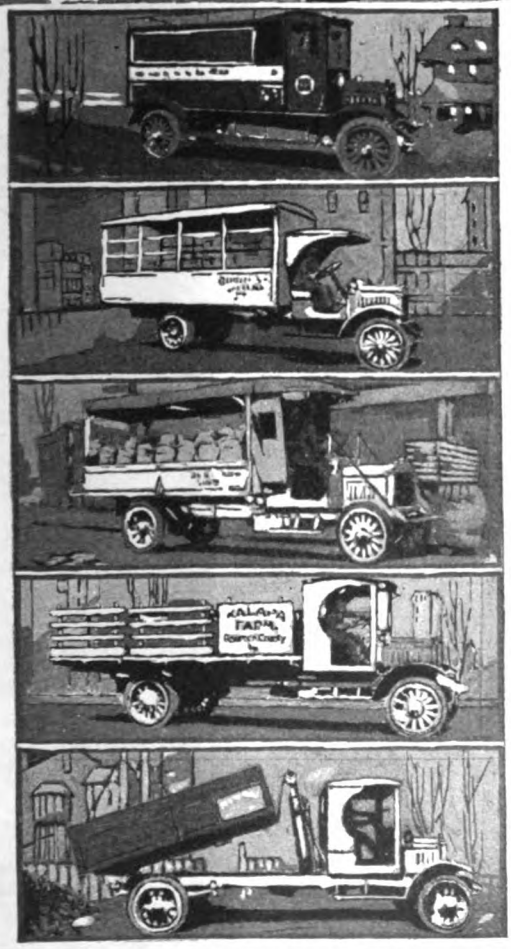
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Be a Full Line Truck Dealer

Among the Dominant Ten manufacturers whose product controls the field, SERVICE stands first as the full line manufacturer whose models show highly individualized design in each truck built.

Six big models, each as individual in its construction as though it were the sole product of the SERVICE factory, give you a truck for every demand.

In the highly specialized 3½ ton contractor's model is the most carefully developed specialized motor truck in the industry.



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67% of SERVICE motor truck sales during the past twelve months were re-orders. This tremendous evidence of owner-satisfaction is the reason why SERVICE dealers make big profits.

The first SERVICE truck in every case becomes a basis for subsequent fleet orders. Business already developed builds more business while you are out opening new fields.

This is the only profitable basis on which you can hope to work.

Special Body Building Plant—For You

With the six highly individual models, each a specialized product, SERVICE also offers you a tremendous body building department. With your order for motor truck equipment, get orders for special bodies. 25% of the total cost of a motor truck ready for the road goes into body building.

We build these bodies for you to sell to your customers.

In these days of fleet equipment and individual orders reaching large totals, a body building department is essential.

Write for the SERVICE Sales Maker

Here is the real essence of SERVICE success—of the success of SERVICE dealers. A complete analysis of Service co-operation and the big backing that helps every SERVICE dealer make big sales—real profits in his territory. It is the most important dealer book ever offered you.

Write for it today

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Dept. V-4, Wabash, Indiana

SERVICE MOTOR TRUCK COMPANY
Dept. V-4, Wabash, Indiana

Please send me the SERVICE Sales Maker and other information regarding a SERVICE dealership.

Name.....

Street.....*Town*.....

State.....*Territory desired*.....

Trucks or cars now handled.....

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"Patent Pending"

Are used by America's leading Truck Builders

These wheels were designed by, and are built under the supervision of, experienced engineers. They have been thoroughly tested and have proved they will stand hard usage and abuse.

Over 25,000 WEST'S CAST-STEEL WHEELS are now used on trucks and not one of them has failed to give satisfaction. Specify WEST'S CAST-STEEL WHEELS on every heavy truck you buy.

SATISFACTION GUARANTEED

The West Steel Casting Company

805-815 E. 70th St. Cleveland, Ohio

"Watch the West Cast-Steel Wheels Go Round"

"WHITNEY" Chains
ARE BUILT FOR STRAINS



We have recently completed another large addition to our factory in order to be of service to our customers and are now in position to make prompt deliveries on most sizes of roller chains.

Whitney Chains are strong, accurate and dependable. They are used by the leading makers of trucks throughout the country.

Insist on "Whitney" Chains when making replacements.

The Whitney Mfg. Co.

Hartford, Conn.

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DOUBLE end steering device of original design makes it not only possible but EASY to back trailer anywhere. Double swiveled tongue; no other trailer has it.

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MONEY FOR DEALERS

The demand for trailers is increasing rapidly as you know. An agency for a good trailer is a good thing, and an Agency for the Detroit Trailer is the best proposition in the Trailer line.

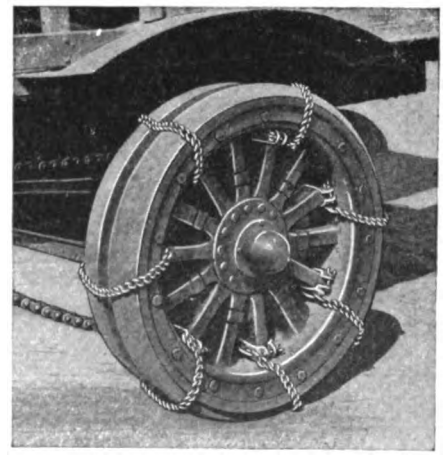
Send for particulars

DETROIT TRAILER COMPANY, Inc.,
671-673 Atwater St., E., Detroit, Mich.
Branch for Canadian Trade—Walkerville, Ont.

SAFETY IS ECONOMY

of time, property and life. The

Prest-O Anti Skid Chains
FOR SOLID TIRES ONLY



is the economical way to protect your truck and its load against the probability of skidding on unsafe roads. It is your safety assurance. Illustration shows chain applied to rear wheel of truck. Cross chains are held in clamps attached to alternate spokes directly under felloe.

Write now for right-price list.

The Rowe Calk Company, Plaintsville, Conn.

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"BOUND BROOK"
Trade Mark Reg. U. S. Pat. Off.
"NIGRUM"
Trade Mark Reg. U. S. Pat. Off.
OIL-LESS BUSHINGS

The builders of the best American Trucks are using "Bound Brook" and "Nigrum" Oil-Less Bushings in places where it is difficult to keep bushings properly lubricated.
These Oil-Less bushings are lubricated for life when made, and add thousands of miles to the continuous, unbroken service of trucks equipped with them.
They are a species of TRUCK INSURANCE that is appealing strongly to truck makers and owners all over the country. They need no attention and outlast all other bushings.
All genuine graphited oil-less bushings have always been made at Bound Brook, U. S. A.

BOUND BROOK OIL-LESS BEARING CO.
Specialists in the Manufacture of Oil-Less for more than a Third of a Century
BOUND BROOK NEW JERSEY

THOMAS TRUCKS
BUILT IN NEW YORK

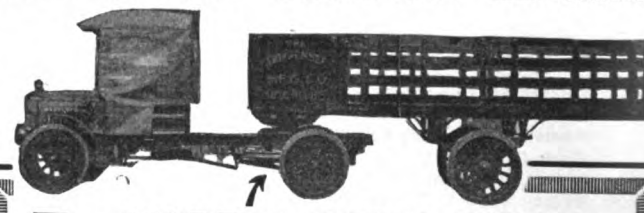
The Thomas is keyed to do things a little better than the best—it has a mission beyond the ordinary. What you know about other trucks is no guide as to what your customers can expect from the Thomas.
The Two Ton Worm Drive
YEARS AHEAD
Dealers—write for specifications and open territory
THOMAS AUTO TRUCK CO., Inc.
Factory and General Offices
639 W. 51st Street, New York City

GUARANTEED FORGINGS
WORCESTER MASS. WYMAN & GORDON CLEVELAND OHIO

Quality in Motor Trucks

It has been our endeavor to create a commercial vehicle that would excel first of all in the quality of the material used, and second, in the economy of its operation.
Our reputation for producing the most lasting truck is recognized by our many users.
We offer for your convenience the following sizes:
1½ ton 3½ ton
2 " 5 "
7 ton
HURLBURT MOTOR TRUCK COMPANY
133rd St. & Harlem River
NEW YORK, N. Y.

One-Ton with Three-Ton Efficiency



The MARTIN FIFTH WHEEL
makes possible this combination of a 1-ton Packard and a 3-ton Fruehauf trailer.
Write for further information
MARTIN ROCKING FIFTH WHEEL CO.
SPRINGFIELD, MASS.

FRAMES
THE PARISH & BINGHAM CO
CLEVELAND OHIO
Our entire engineering force is at your disposal.

Strong—Sturdy—Wonderful
METZ
HIGH-DUTY
ONE TON TRUCK
$695
METZ COMPANY
WALTHAM, MASS. U. S. A.

Empire Worm Drive Axles of accepted design are built for Commercial Vehicles ranging in capacity from one to seven tons pay load.
Special **Empire Worm Drive Axles** are made also for Electric Pleasure Cars, Electric Trucks, Gasoline Fire Trucks, Armored Trucks and Industrial Trucks.
EMPIRE AXLE COMPANY
DUNKIRK, NEW YORK

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The Pull-More Truck Will Pull More Profits For You

PULL-MORE MOTOR TRUCK CO.
THE UNION ARCADE PITTSBURGH, PA.

DEALERS MAKE MONEY!

Get the agency for the "Tonford" truck unit—one of the quickest selling propositions you ever tackled. Attached to a Ford chassis, makes a one-ton truck. Light, strong, economical, easily handled. Drygoods merchants, furniture dealers, retailers in almost every line, bottlers, farmers, creameries, all want it. Find it best possible buy.

$325 Tonford $325
—TRADE MARK

All the facts that sell the Ford, sell the Tonford. Highest grade truck attachment made—easiest to attach—strongest, most durable. Best constructed truck unit on market—lowest priced. Get busy now, while territory is still open. Write today. Learn how "Tonford" dealers pile up profits.

DETROIT TRUCK COMPANY, Mfgs., Detroit

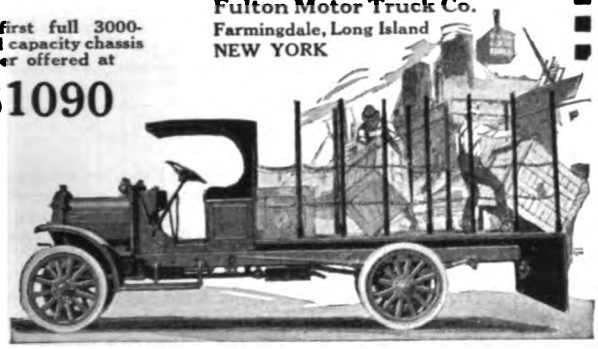
THE FULTON TRUCK

Dealers—*Write for territory still open*

The first full 3000-pound capacity chassis ever offered at

$1090

Fulton Motor Truck Co.
Farmingdale, Long Island
NEW YORK



GET OUR OFFICIAL BLUE BOOK

The BANTAM BALL BEARING CO.
BANTAM, CONN.

DETROIT OFFICE
905 Dime Bank Bldg., Detroit, Mich.

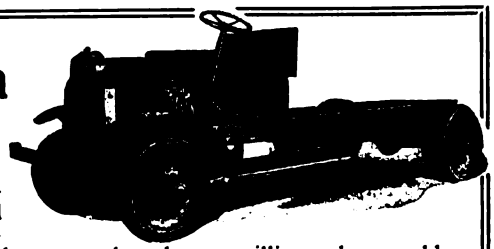
F. M. COBBLEDICK CO.
693 Mission St., San Francisco, Cal.

BOSCH MAGNETO IGNITION

is used by most makers of Motor Trucks. That is the best reason for its being on your truck. Write us about it.

Bosch Magneto Company
203 West 46th Street New York

Lamson Trucks



—worm drive—built large and sturdy for severe service—always ready—always willing—always able to deliver the load wherever a motor truck can go. Made in 5 sizes—1 to 5 ton—all oversize jobs.

Write for Catalog, prices, etc.

LAMSON TRUCK & TRACTOR CO.
General Offices and Service Station
4644 W. MADISON STREET CHICAGO, ILL.

F W D TRUCKS

Dependability

The four wheel drive principle as applied in F-W-D Trucks makes for dependability in every condition, road, load or traffic. Every point is clearly demonstrable and every demonstration brings out the fact that the adoption of the F-W-D Truck will be a lasting, good investment—one that pays dividends in economy, durability and continuous service.

Dealers who desire to build up a truck business on the sound basis of continued satisfaction to their customers are acceptable in unoccupied territories. To such we will gladly send details of our dealers' arrangement with prices, discounts and terms.

Write for the new illustrated catalog.

Four Wheel Drive Auto Co. Dept. K Clintonville, Wis.

America's Standard Motor

Commercial Four-Cylinder Models

Model N.....3½ x 5
Model N.....3¾ x 5
Model C.....3¾ x 5¼
Model C.....4⅛ x 5¼
Model E.....4½ x 5½



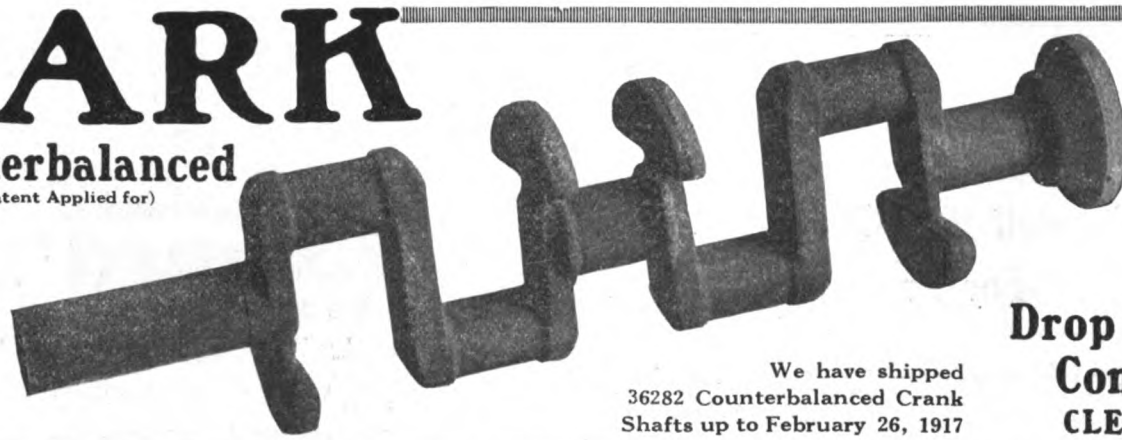
CONTINENTAL Motors Corporation
Detroit—Muskegon, Mich.

Continental Motors

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PARK

Counterbalanced
(Patent Applied for)

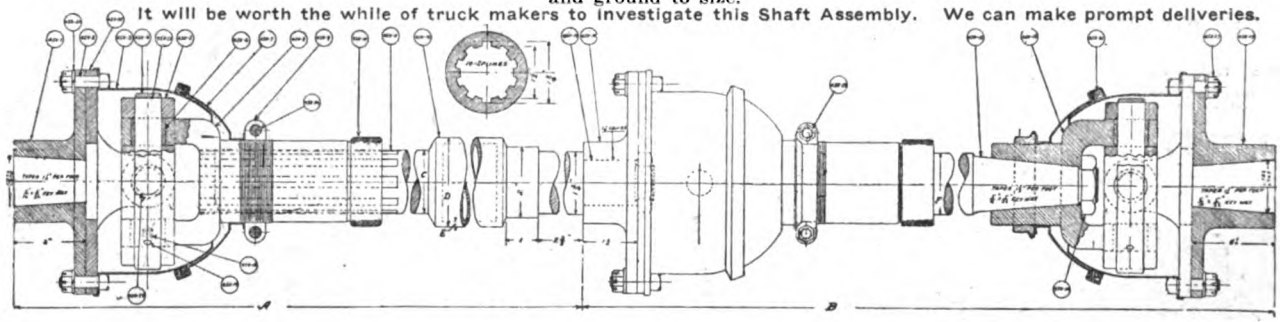


We have shipped
36282 Counterbalanced Crank
Shafts up to February 26, 1917

The Park Drop Forge Company
CLEVELAND

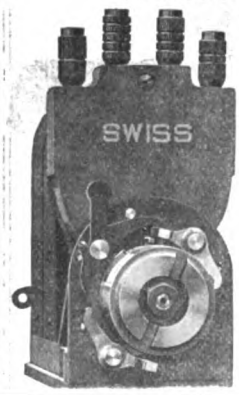
This is Our Three Joint Shaft Assembly, No. 450

Built for heavy duty trucks of 2, 3 and 5 ton capacities. Made from drop forgings, heat-treated. All wearing parts are case hardened and ground to size.
It will be worth the while of truck makers to investigate this Shaft Assembly. We can make prompt deliveries.



THE KINSLER-BENNETT CO. **Morgan & Market Streets** **HARTFORD, CONN.**

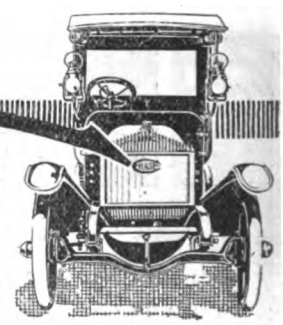
Wherever You See The Swiss Magneto



in a motor truck you will know that the manufacturer of that truck has sacrificed some of his profit in order to give the owner the best ignition known. Don't let the manufacturer of your truck increase his profits at your expense by installing cheap, unreliable ignition.

The Swiss Safety Starting Coupling Absolutely Prevents Back Kicks from Pre-Ignition. It is the only coupling with which the impulse spring cannot interfere with the proper action of the magneto. Write us for Bulletin 5 Today.

SWISS MAGNETO COMPANY
MONROE, MICH.



Back of the sale the name—back of the name the makers. A Chase agency marks the difference between an occasional sale and big business. Write for Selling Plan particulars.

Models ¾ Ton to 3½ Tons
Worm Drive Exclusively

CHASE MOTOR TRUCK CO., Syracuse, N. Y.

CHASE

CULLMAN SPROCKETS

in stock and to order.

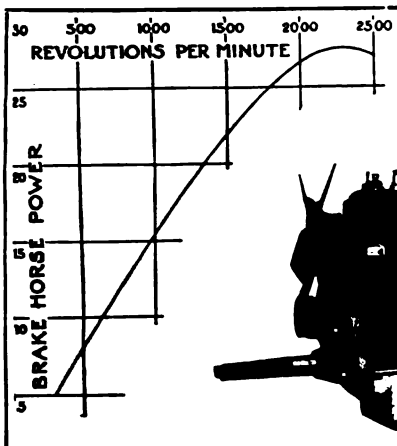




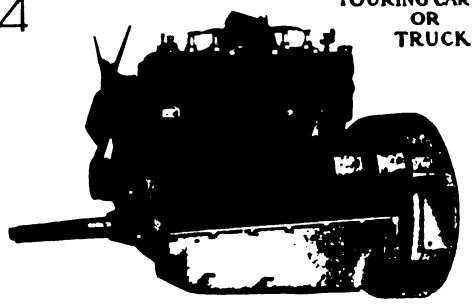
For Block, Roller and High Speed Silent Chains.
New Catalog.

Cullman Wheel Co., 1350 Altgeld St., Chicago

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LE ROI MOTOR
3⅛×4½ MODEL C
FOR THE LIGHT ROADSTER
TOURING CAR
OR
TRUCK



Used by leading manufacturers of best-known American-made light trucks.

The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

CABLE LE ROI MILWAUKEE

Cut Down Expenses with GOODRICH DE LUXE TRUCK TIRES



You reduce both operating expenses and depreciation charges when you equip your trucks with **Goodrich De Luxe** truck tires. They make lay-ups for tire changes less frequent—likewise lay-ups for repairs to the truck.

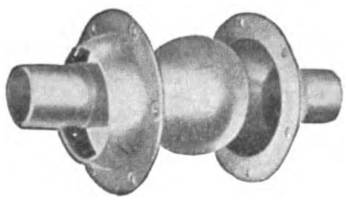
The deeper tread absorbs much of the vibration so destructive to truck mechanism. It means long life to the truck as well as to the tire. This double saving gives truck users another reason for saying that **Goodrich De Luxe** truck tires deliver "Velvet Mileage."

Prove this conclusively by using our Motor Truck Expense Record Books which we furnish upon request.

The B. F. Goodrich Rubber Co.
AKRON, OHIO

BOSSERT

In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice.



We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



The Bossert Co.
UTICA
N. Y.

CO-OPERATION

GRAMM BERNSTEIN

GRAMM-BERNSTEIN co-operation not only means a truck of proven superiority in quality and performance, but the personal backing of the Gramm-Bernstein Company itself. Pioneering the motor truck industry for sixteen years we believe qualifies us properly to co-operate with G-B dealers.

The complete G-B line — 1 to 6 tons capacities—enables the G-B dealer to properly fill every truck requirement. Write for particulars of the G-B sales plan—it's broad, practical and is attracting the country's best dealers. Write today.

THE GRAMM - BERNSTEIN
MOTOR TRUCK COMPANY
13 Gramm Blvd. Lima, Ohio

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—Sheldon Springs—

Designing a truck presents no nicer problem than that of providing it with springs.

No concern in the world is as well prepared to solve this problem—none with the amount of experience—none with the varied experience—none with the facilities and equipment, either human or mechanical, that the Sheldon Axle and Spring Co. offers.

Collectively—these facts are the reason why the service Sheldon Springs will give is a known quantity and a guaranteed quantity.

SHELDON AXLE and SPRING COMPANY

Wilkes-Barre, Pa.

Makers of Springs and Axles for Heavy Duty Service for more than 50 years.

Chicago: 122 S. Michigan Blvd. San Francisco: 444 Market St. Detroit: 1215 Woodward Ave.

BROWN-LIPE

transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

BROWN-LIPE GEAR CO.
SYRACUSE, N. Y., U. S. A.

BROWN-LIPE CHAPIN CO.

Differentials Transmissions

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SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
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STANDARDIZE YOUR COST ACCOUNTING!

Throw away your old accounting outfit for keeping track of your motor truck operating costs.

Get the Standardized cost system, which is being used by users all over the country in every line of business.

Get the Most Complete set of records possible, including a performance record as well as an account of expenses.

Get the simplest one which is complete in every detail and which can be kept by any adult of ordinary experience.

Try it for 10 days—if not satisfied return it and get the full price paid.

Compiled by experts with many years of experience with many different sorts.

Published by the oldest publication devoted to motortruck operation and efficiency.

Used by progressive users of trucks in all lines of work all over the country.

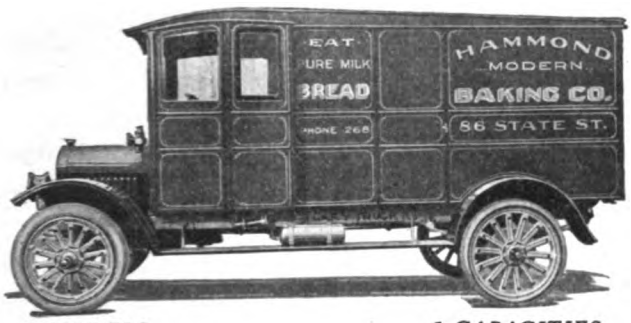
Endorsed by the Federal Trade Commission, the highest authority on standardized cost accounting.

$4 for complete system to subscribers to
THE COMMERCIAL VEHICLE
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The Commercial Vehicle
239 West Thirty-ninth Street,
New York City

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The
Gary Motor Truck Company
Manufacturers of
Gary Worm Drive
MOTOR TRUCKS



5 MODELS 5 CAPACITIES

¾ Ton 1 Ton 1½ Ton 2 Ton 3 to 3½ Ton

Complete 1917 Catalog will be mailed Promptly on Request

General Offices:
GARY MOTOR TRUCK COMPANY
610 BROADWAY GARY, INDIANA



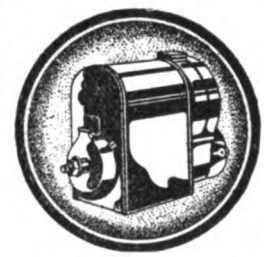
Power!

Power at low speed—power enough and to spare—that's what counts in a heavy truck. When the motor turns slowly, the compression is maximum, the mixture often too dense for an ordinary spark to penetrate. The

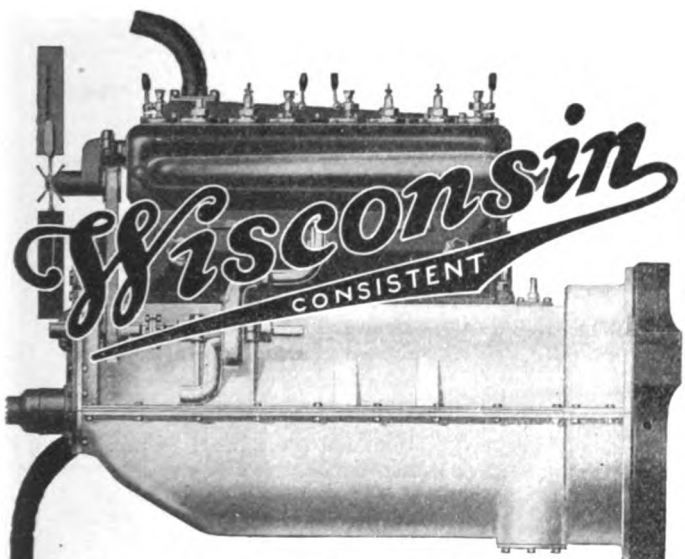
EISEMANN MAGNETO

is standard equipment on 72 different makes of trucks, largely because the manufacturers' tests have shown that the incensely hot, powerful Eisemann spark penetrates the densest compression even when the motor is barely turning over!

In all, 117 manufacturers have adopted the Eisemann Magneto as standard equipment. They know its dependability, its durability its power.



The Eisemann Magneto Co.
Sales and General Offices
32-33d St. Brooklyn, N. Y.
Chicago, Ill., 910 So. Michigan Ave.
Detroit, Mich., 802 Woodward Avenue



Thinking About Trucks?

If you are, you're thinking about motors—wondering which one will stand up best under the tests your work will put it to. Men who know motors will tell you there's dependable quality in Wisconsin Consistent Motors that keeps them on the job, working at full efficiency.

Motors for pleasure cars, trucks and tractors. Write for specifications.

Wisconsin Motor Mfg. Co.
Sta. A-Dept. 319 Milwaukee, Wis.

New York Branch: 21 Park Row, T. M. Fenner, Factory Representative.
Pacific Coast Distributors: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles Co., Los Angeles, Cal.

STEGEMAN 6 (SIX CYLINDER) TRUCKS

THE ONLY SIX CYLINDER



THE Stegeman is the only line of Trucks powered with a Six Cylinder Motor. This is the most sweeping development in the Truck Industry. A year's continuous tests have demonstrated the Stegeman Six Cylinder undisputed Master of the Truck situation—both as to economy and endurance.

Agencies Go Quickly

Because Stegeman Six Cylinder trucks with electric starter furnish a string of argument that clinch sales and back competition clean off the board.

Sizes 2, 3, 4, 5 and 7 Ton

Stegeman Motor Car Co. Milwaukee

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On account of freight car shortage and railway congestion this fleet of International Motor Trucks was driven overland from Akron Works to Buffalo



INTERNATIONAL

Motor Trucks Continue in First Place!

THESE are the trucks of which there are more at work than of any other line of motor trucks made—a remarkable record. This year the factory and output are to be more than doubled to meet the fast-growing demand. At present the 1917 sales are three times as great as for the corresponding period in 1916.

International trucks are popular because for years they have been saving and making money for men who have material and supplies to transport. They will handle **your** hauling rapidly and economically, in the right size and style of tried-out motor trucks, giving day-in day-out service, making the best impression through both appearance and reliable performance. **Here** is better business for you! Consider these

LOW-PRICE INTERNATIONALS

Model H—1500 lbs. capacity, internal gear drive (chassis) $1225

Model F—2000 lbs. capacity, internal gear drive (chassis) $1500

Prices cash f.o.b. factory

Eighty-nine company branches and thousands of local distributors cater to the needs of **International** owners. Up-to-the-minute service is always at your hand. Write to the address below for attractive folders with all the details and full information. You owe it to the prosperity of your future to know more about the **International** Motor Trucks. **Now** is the best time to write.

International Harvester Company of America (INC.)

88 Harvester Building Chicago U S A

D S B

Heavy Duty Truck Frames

Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

Added capacities together with latest type equipment enable our assuring you of satisfactory service.

Our engineers are at your service, and we solicit your inquiries.

Driggs-Seabury Ordnance Co.
Sharon, Penna.

Sell ***Sootless***

The *Better* *Plug*



SELL *Sootless Plugs*—because they're *better* Plugs.

Because their perfectly protected firing points constantly scour themselves clean.

Because their multi-wound mica insulation is far stronger than porcelain or stone.

Because their patented, exclusive construction keeps them gas-tight—oil-proof—clean.

And because *Sootless Service* paves the path for profits from your other lines.

Write for catalog and discounts today

THE OAKES & DOW COMPANY
Dept. "V", 15 Chardon St., Boston, Mass.

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"We want your O.K. on our brakes before we go"

Educating Motorists to ask dealers' advice on brake lining

We aim to increase your brake lining business by educating car-owners to say this every time they leave a garage. We are showing them why they should reline their brakes with efficient brake lining if there is any slip or grab.

We are teaching them to insist on 100% efficient brakes. In our advertisements now running in the Saturday Evening Post, Collier's Weekly, Literary Digest, Christian Herald, Country Gentleman, Life, and motor publications, with nearly 4,000,000 readers—we are teaching motorists to *be sure of their brake lining* and to specify Thermoid Brake Lining. This means an increased demand for Thermoid Brake Lining which you will feel.

Proving Thermoid Brake Lining's Quality

We are proving the quality of Thermoid Brake Lining by listing in our advertisements the twenty-two leading cars and ten leading axles which use Thermoid Brake Lining. Motorists are sure to specify the brake lining that *experts* specify. Many motorists are going to come to you and specify Thermoid. Be ready for the demand.

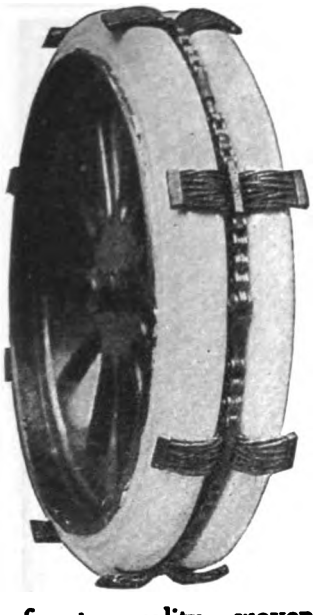
We will send you free illustrated price lists and a store sign that will tell your customers you handle Thermoid Brake Lining.

Thermoid Rubber Co.
Factory and Main Offices:
TRENTON, N. J.

BRANCHES: New York, Chicago, San Francisco, Indianapolis, Detroit, Los Angeles, Philadelphia, Pittsburgh, Boston, London, Berlin, Paris.

Our Guarantee:
Thermoid will make good or WE WILL

Thermoid
BRAKE LINING
WON'T GRAB OR SLIP



Don't Wait

until the streets are covered with ice and snow, before getting "NEVER-SKIDS" for your motor trucks.

THE NEW TYPE

NEVER-SKID

practically eliminates vibration

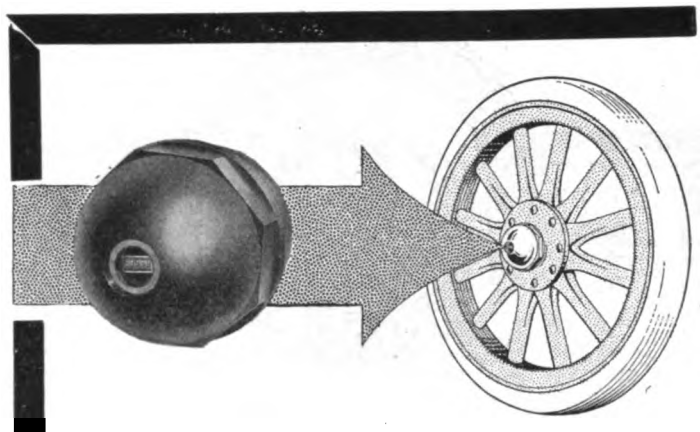
Does away with skidding and affords positive traction on slippery streets. The cross-pieces are made of the finest quality woven steel wire — strong enough for the heaviest machines made.

The device can be applied in a few minutes without jacking up the truck, and there is no danger of its catching in driving chains or damaging tires.

YOU WILL SURELY NEED "NEVER-SKIDS" this winter.
Why not get them now?
Folder and prices will be gladly sent

NEVER-SKID MFG. CO.

122 Liberty Street, New York, N. Y.
New England Distributor: WILLARD B. DAVIS, 39 Danforth Street, Fall River
Chicago Distributor: FRED ALLEN AUTO SUPPLY CO., 1610 S. Michigan Avenue



Are you wasting gasolene?

Are you getting full mileage out of your tires? Are your drivers efficient?

There is one way to find out—keep accurate mileage records with the

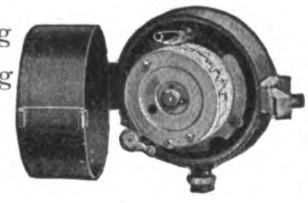
DREADNAUGHT *Indestructible* Hub Odometer

The Dreadnaught gives accurate, continuous mileage records—points out delivery leaks and enables you to run your trucks at top efficiency. Easy to read—dust-proof, grease-proof and figures are always right-side up. It's the only hub odometer guaranteed indestructible—a new one free if you break it, no matter how.

RECORDOGRAF

gives you an accurate tape-record of your car during every minute of the day. It shows:

(1) Time truck is standing
(2) Time truck is moving
(3) Distance covered
(4) Speed at all times



Write for booklet and prices.

AMERICAN TAXIMETER COMPANY
Mfrs. of Jones and Popp Taximeters
Broadway at 57th Street New York City

Service Stations in the Following Cities
San Francisco New Orleans Washington Chicago Detroit
Philadelphia Seattle Boston Pittsburgh St. Louis

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THE MARK OF A BETTER RADIATOR

G & O
Radiators
for
Heavy
Duty
Service

The G & O Mfg. Co.
New Haven Connecticut

AGENTS WANTED



"Little Giant" in the service of the
Inland Steel Company

Owing to territorial adjustments we now have several money making territories open to live agents. If you want to connect with a progressive motor truck manufacturer who backs his guarantee with $12,000,000.00 capital, who has had twenty-five years manufacturing experience and who has 25,000 satisfied customers in the United States

Here is Your Opportunity.

The "Little Giant" Line Includes

Little Giant Convert-a-Car.
(Converts any Ford into a one ton truck)
Model 15—1 Ton Worm Drive
Model 16—2 Ton Worm Drive
Model 17—3½ Ton Worm Drive

SPECIAL BODIES FOR EVERY PURPOSE

Write for Prices, Specifications and Terms

CHICAGO PNEUMATIC TOOL CO.
615 Little Giant Building CHICAGO
Branches and Service Stations Everywhere

The GLOBE Truck
The Motor Truck PLUS

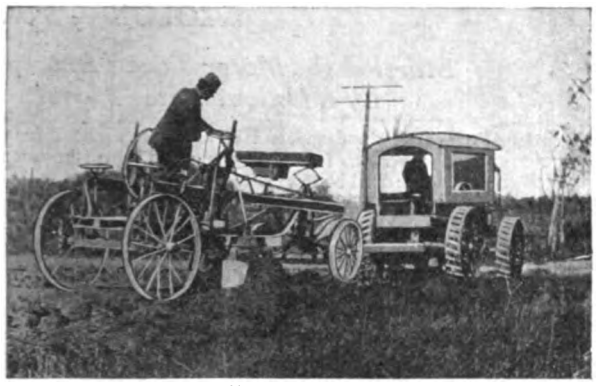


Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

Globe Motor Truck Co.
721 Wright Bldg. St. Louis, Mo.

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Lenox "American" Tractor



The "American" doing practical road work

SPECIAL ADVANTAGES

4-wheel drive, 4-wheel steer, light weight, extreme flexibility and unusual amount of horsepower actually delivered at the drawbar.

Catalogue and prices on request.

Manufactured by

LENOX MOTOR CAR COMPANY
BOSTON, MASS.

1000 Pound Capacity

Sheridan Commercial Car

Ready for Delivery Now

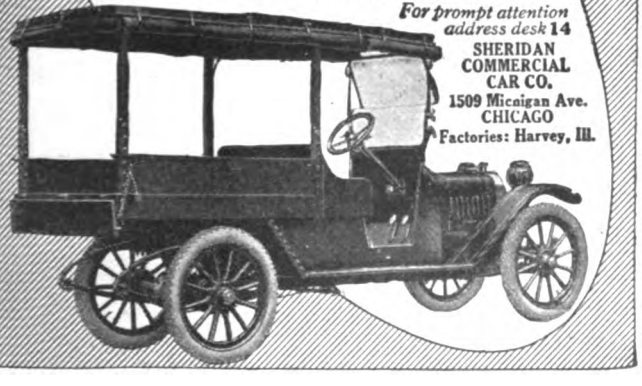
Fully Equipped Price $540

THE SHERIDAN is the lowest priced delivery car on the market. Thoroughly equipped and properly built to do the work it's designed for—haul 1000 pounds any time—anywhere. Ample in size, load capacity and power.

Sells fast to a big, ready-made field of *buyers*. Not a rebuilt pleasure car. Made a truck through and through by manufacturers of trucks, to replace horses where price is what counts. Chassis alone, **$490.** Fully equipped, **$540.** Write or wire for complete details. Make territorial reservations now. Dealers make good.

For prompt attention address desk **14**

SHERIDAN COMMERCIAL CAR CO.
1509 Micaigan Ave.
CHICAGO
Factories: Harvey, Ill.



POLACK TYRES

"The Highest Priced Tires in America"

It Isn't Enough—

It isn't enough to be satisfied with the quality of engine, transmission, axles, etc., of the truck you buy, because the life of these mechanical parts depends largely upon the **tires** they ride upon.

Polack European Standard (high profile) Tyres offer best insurance against lay-ups because the **extra rubber** absorbs jolts and jars.

So Polacks, "the highest priced tires in America," **guaranteed 10,000 easy-riding miles,** are the lowest in **cost per mile**—any way you care to figure it.

Polacks S. A. E. profile supplied by all representative truck manufacturers at no extra charge.

Demand Polacks on your new truck and write us about it.

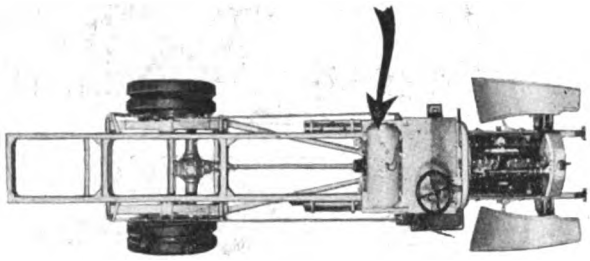
Polack Tyre & Rubber Co.

1876 Broadway **NEW YORK CITY**

Branches and Service Stations in All Principal Cities



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General Vehicle Co. Trucks

are equipped with the

"JASCO" TANK

Why? Because demonstrated service facts have proven that this gasoline receptacle makes fuel absolutely safe from fire or explosion and devotes every drop to energy.



"JASCO" TANKS are made of drawn steel. They are seamless, tinned and tested and positively cannot spring a leak even under the most severe conditions. They are money savers, life and property protectors. If your car is equipped with an old fashioned riveted tank you are courting danger. Investigate the "JASCO" today. Full details on request.

The "Jasco" Tank is used and indorsed by the following prominent manufacturers:

PLEASURE CARS

Biddle Motor Car Company, Simplex Automobile Company, Mercer Automobile Company, Lozier Motor Company, Stanley Motor Carriage Company, James Cunningham Son & Company, H. H. Franklin Mfg. Company.

TRUCKS

Baldwin Locomotive Works, Autocar Company, General Vehicle Company, H. G. Burford Company, Peerless Motor Car Company, Garford Motor Truck Company, Gramm Motor Truck Company, Thomas Auto Truck Company, Motor Trucks, Ltd., Canada.

JANNEY, STEINMETZ & CO.

Main Office: PHILADELPHIA

New York Office: HUDSON TERMINAL BUILDING

Standard

MADE IN DETROIT USA

Motor Trucks

Startled the Motor Truck Industry By a Unique Sales Plan

First of all, the Standard is an unusual truck. It is a powerful combination of many of the world's best-known units—the Continental Motor; Timken Axles; Timken Bearings; Brown-Lipe Gears, and other well-known standard parts.

The Standard Motor Truck is sold in an unusual way. Any responsible person can be the agent for the Standard, with absolutely *no investment—no deposit* and *no contract.*

Write for details of this plan. *No obligation.*

STANDARD MOTOR TRUCK CO., 315-327 Bellevue Ave. Detroit, Mich.



SERVICE

"The Steering Gears that Predominate on Motor Trucks"

Enormous bearing surfaces, highest quality materials and careful workmanship guarantee the safety, reliability and easy operation of

ROSS GEARS

Our fire-proof, day-light plant, modern, specially designed machinery, and unequaled facilities for securing raw materials, are assurance of SERVICE in deliveries.

On quality and service, Ross Gears are now in use on 124 different makes of motor trucks.

Write for catalog

ROSS GEAR & TOOL CO.
750 Heath Street Lafayette, Ind.



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FULLER
Unit Power TRANSMISSIONS

Look for the name **FULLER** on your transmission

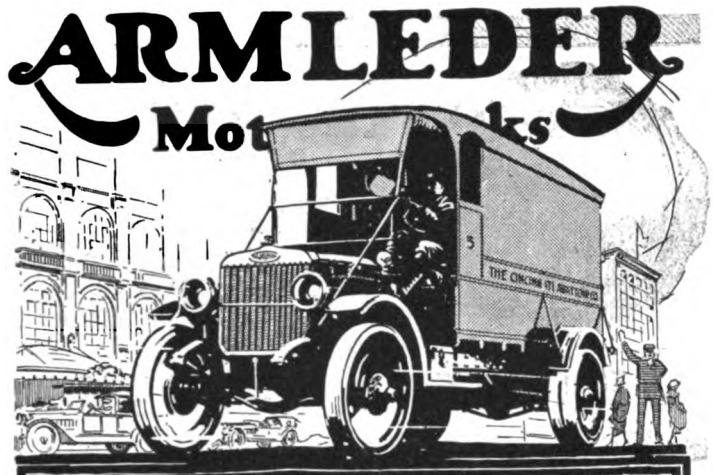
It stands for the best that can be built



Eastern Representatives
EARLE & BOGGS
1790 Broadway, N. Y. C.

FULLER & SONS MFG. CO.
Kalamazoo, Mich.

ARMLEDER
Motor Trucks



ARMLEDER MOTOR TRUCK SALES MULTIPLY

Wherever one Armleder motor truck goes into service there are shortly two, three, four — and many more.

The inherent staunchness of the Armleder truck—its right design, its incomparable materials, the great satisfaction it gives Armleder owners—quickly sell other Armleders.

That is why Armleder dealers have flourishing and substantial businesses. They found first sales easy in new territory. So will you.

Write now for the dealers' proposition.

Worm-Drive Two-Ton
Three-and-a-Half-Ton

The O. Armleder Company
Twelfth, Plum and Charles Streets
CINCINNATI, OHIO

THE KREBS COMMERCIAL CAR CO. CLYDE, OHIO U.S.A.

Real Value

You get the full value of your money and more when you invest in a KREBS Truck.

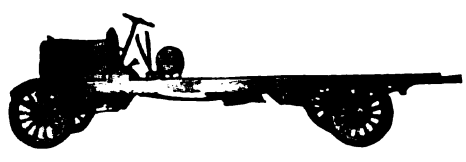
Guaranteed by manufacturers with 16 years' experience in motor vehicle construction, the KREBS combines Simplicity and Low Maintenance with Efficiency and Reliability.

It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault-type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.
KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.
Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.



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ACME
THE TRUCK OF PROVED UNITS

Know HOW and WHY Our Plan Builds Business

The tremendous interest in our new dealer plan is due to two things—the sincerity of the offer, and the nation-wide reputation of The Acme—The Truck of Proved Units.

Immediate Opportunity

Here is immediate opportunity provided your territory is still open. We suggest you wire or write at once to know.

Your "prospects" know the big powerful Acme. Proved Units—Continental Motor, Timken Axles, Bearings and Worm-Drive, Detroit Springs, etc., are of known superiority.

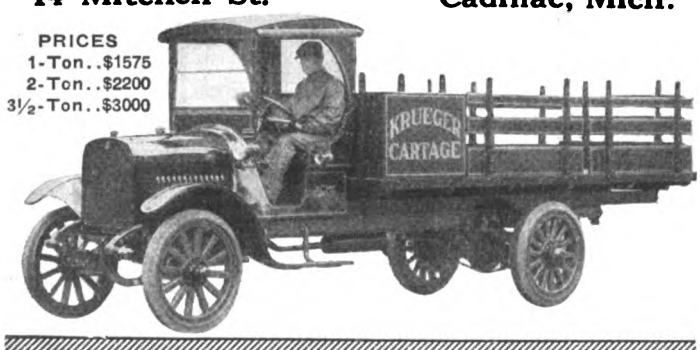
Wire or Write Today

You owe it to yourself to know the new Acme plan. Get our new book, "A Pointer to Profits"—just off the press. We urge you to act quickly.

Cadillac Auto Truck Co.

14 Mitchell St. Cadillac, Mich.

PRICES
1-Ton..$1575
2-Ton..$2200
3½-Ton..$3000



Cadillac Auto Truck Co.,
14 Mitchell St.,
Cadillac, Mich.

WRITE REQUEST HERE

MACCAR

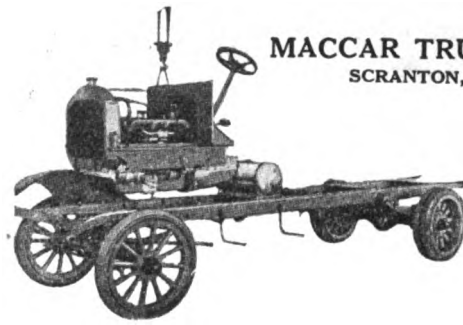
Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.

If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.

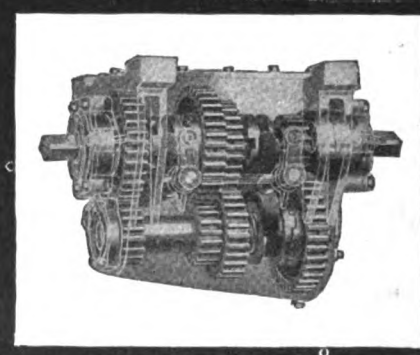
The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.

Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.



MACCAR TRUCK CO.
SCRANTON, PA.

COTTA TRANSMISSIONS



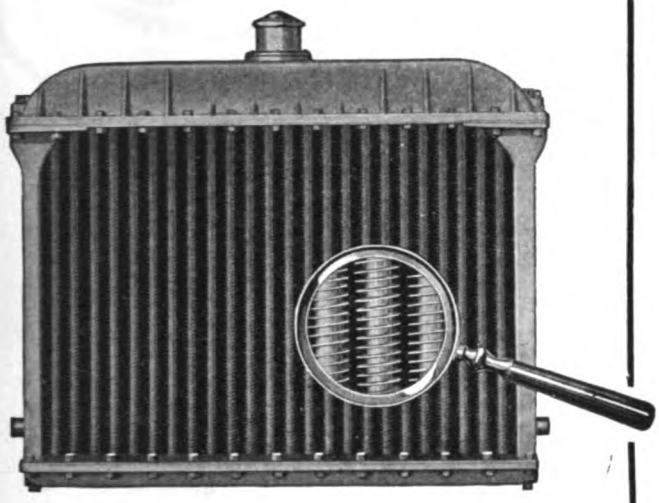
All Gears Always in Mesh

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

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Seamless Copper Helical Tube Cooling Sections

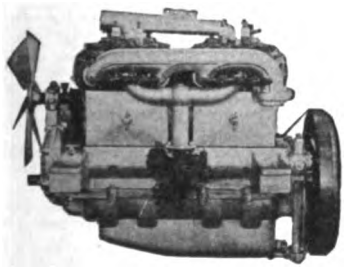


Are Guaranteed for the Life of the Motor on Which They are Installed

Helical Tube Construction is Accepted as the Best by the Leading Truck Makers of America

Manufactured only by

ROME-TURNEY RADIATOR CO.
ROME, NEW YORK



Beaver Motors Make Their Way By The Way They Are Made

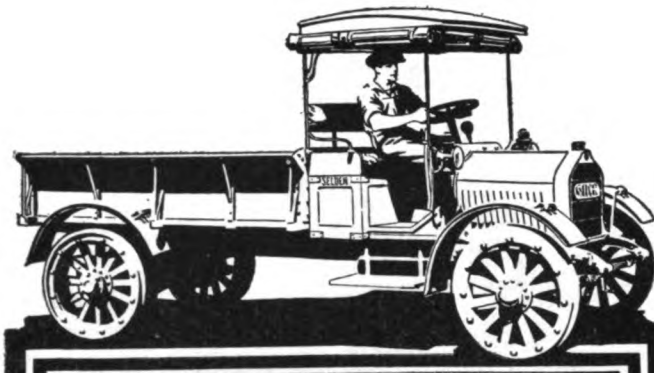
BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications

BEAVER MFG. COMPANY
Milwaukee Wisconsin



Compare Selden *"In-Built Quality"*

Trucks part for part with other "quality" trucks of the same rated capacity and you will find in

SELDEN TRUCKS

bigger, better construction—greater strength—greater hauling power — greater speed — greater ability to render long, profitable service.

Never before was greater truck value offered for the money than the Selden Complete Line of ¾ Ton, 1 Ton, 2 Ton, 3½ Ton and 5 Ton Model offers. These big, powerful trucks render the kind of service that makes it profitable to haul by motor truck—the kind that pays dividends for years after the investment.

Dealers: We have a Sales Proposition for you that is different and more liberal than any you have ever had offered to you before. Write for it AT ONCE — BE QUICK — for soon it will be too late.

Selden Truck Sales Co.
Rochester, N. Y., U. S. A.

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The talk has turned to equipment



"Now, gentlemen," said the General Manager of a large motor car factory, "the success of our car has been built up by sincerely studying where improvements could be made in efficiency, durability and quality refinements."

"What about bearing equipment on our new models?"

"I am convinced that this matter of bearings is vitally important," replied the Sales Manager. "From the standpoint of the purchaser of the car, and as a selling proposition, ball bearing equipment—a full jeweled job, giving every rotating part in the chassis the frictionless movement of a full-jeweled watch—has a decided selling advantage. I submit that we equip throughout with ball bearings."

"I second that recommendation," said the Advertising Manager, "for ball bearings throughout will be an added and convincing publicity feature in the sale of our car."

"What do you say, Mr. Engineer?" inquired the General Manager.

"It certainly follows the best engineering practice," replied the engineer. "Ball bearings reduce frictional resistance and wear to the vanishing point, give longer life to every part of the machine, successfully resist shocks, thrusts, stresses, from any and all directions. In my opinion, ball bearings in our car mean chassis perfection."

And the Master Mechanic added: "Yes, and ball bearings are a complete, self-contained unit that never require adjustment, are absolutely trouble proof, and offer the advantage of comparatively inexpensive installation, assembly and upkeep."

This conversation is interesting to every dealer and car owner, for

NEW DEPARTURE BALL BEARINGS

mean not only mechanical perfection, but highest efficiency in service and lowest operating and upkeep cost.

Send for the interesting booklet "New Departure Ball Bearings and what they mean to the Car Owner."

THE NEW DEPARTURE MFG. CO.
BRISTOL, CONN. 818-20 Ford Bldg., DETROIT

GMC
GENERAL MOTORS COMPANY
TRUCKS

This trade mark stands for a complete line of trucks *built in worm and chain drive* to meet the varied demands of city and country work—a truck to fit your business.

Send for catalogues today

GENERAL MOTORS TRUCK COMPANY
One of the Units of General Motors Co.
Pontiac, Michigan

Branches and Distributors in principal cities (84)

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of Commercial Vehicle, Inc., published semi-monthly at New York, N. Y., for April 1, 1917.

State of New York, County of New York, ss:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared E. M. Corey, who, having been duly sworn according to law, deposes and says that he is the Treasurer of the Commercial Vehicle, Inc., Publishers of Commercial Vehicle, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Commercial Vehicle, Inc., 239 West 39th St., New York; Editor, M. C Horine, 239 West 39th St., New York; Managing Editor, David Beecroft, 239 West 39th St., New York; Business Manager, C. W. Blackman, Flushing, New York.

2. That the owners are:

Owners, Commercial Vehicle, Inc.—239 West 39th St., New York.

Stockholders Commercial Vehicle, Inc.—Estelle A. Blackman, Flushing, New York; Class Journal Co., 239 West 39th St., New York.

Stockholders Class Journal Co.—United Publishers Corp., 239 West 39th St., New York.

Stockholders United Publishers Corp.—H. M. Swetland, 239 West 39th St., New York; C. T. Root, 239 West 39th St., New York; C. G. Phillips, 239 West 39th St., New York; W. H. Taylor, 239 West 39th St., New York; A. C. Pearson, 239 West 39th St., New York; Max Holtz, 239 West 39th St., New York; J. M. Phillips, Upper Montclair, N. J.; W. H. Lindsay, 239 West 39th St., New York; Estate of I. A. Mekeel, Montclair, N. J.; Fritz J. Frank, 239 West 39th St., New York; M. C. Robbins, 239 West 39th St., New York; W. I. Ralph, 239 West 39th St., New York; Geo. H. Griffiths, 239 West 39th St., New York; G. E. Sly, 50 Union Sq., New York; E. J. Rosencrans, 50 Union Sq., New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

Bondholders, Commercial Vehicle—None.

Bondholders, Class Journal Co.—United Publishers Corp., 239 West 39th St., New York.

Bondholders, United Publishers Corp.—H. M. Swetland, 239 West 39th St., New York; C. T. Root, 239 West 39th St., New York; C. G. Phillips, 239 West 39th St., New York; W. H. Taylor, 239 West 39th St., New York; W. I. Ralph, 239 West 39th St., New York; F. T. Root, 239 West 39th St., New York; Saunders Norvell, 91 Fulton St., New York; W. H. Lindsay, 239 West 39th St., New York; Estate of I. A. Mekeel, Montclair, N. J.; E. P. Whittemore, Evanston, Ill.; E. S. Root, 309 West 92d St., New York; J. M. Phillips, Upper Montclair, N. J.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) E. M. COREY.

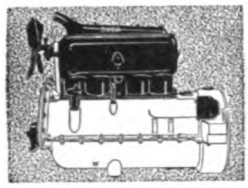
Sworn to and subscribed before me this twenty-third day of March, 1917.

L. F. DAY,
Notary Public, Queens Co., Clerk's No. 1804.

Certificate filed in New York Co. No. 266. New York Register No. 8305.
(My commission expires March 30, 1918.)

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"LET US HAVE THE FACTS"—No. 8



ACCESSIBILITY

Two motors of different make may be equal in quality, skill of manufacture and performance—at first. In performance one soon falls behind. It lacks a most important feature of design—accessibility. The necessary adjustments cannot be made easily and cheaply, and as a result they are not made as often as they should be.

The BUDA MOTOR

of today has not been *designed* in the strict sense of the word. It has been *developed* in accord with the BUDA policy along lines which long experience in practical use has proved the best. Extremely high mechanical efficiency and accessibility have been developed side by side. Buda records for durability, power and torque are well known. Buda accessibility has been as fully attained.

The BUDA MOTORS for cars, trucks and tractors bear the closest technical examination. Try it. Ask for

The new truck motor catalog containing full specifications.

THE BUDA COMPANY, HARVEY (Chicago Suburb), ILL.

Repeat Orders

Each day sees new repeat orders come to us from customers who have proven for themselves the wonderful superiority of

Mack TRUCKS

A man may buy a truck the first time because he likes the looks of it. But when he buys the second one, he buys it because he knows it is the truck he needs.

International Motor Company
64th Street and West End Avenue
New York City

DIAMOND T TRUCKS

Diamond T Service is as thoroughly built into our ¾-ton trucks, the smallest of the line, as it is in our 3½ ton model.

Its low cost is made possible only by its wide popularity which has enabled us to produce this model in enormous quantities. There has been no cheapening of quality or inferior workmanship permitted in its design or construction.

For a thousand uses it is the most satisfactory and economical delivery vehicle ever marketed. With a body suited to your requirements, it will improve your delivery service while lessening your operation expense.

Write to-day for catalog.

Diamond T Motor Car Co., Chicago, Ill.



PIERCE Governors



Guarantee Motor Truck Efficiency

Owners of motor trucks are learning from experience that the only proper way to judge any truck is to take into consideration cost of upkeep, cost of operation, and performance—three features which are vitally dependent upon the governor. A thoroughly reliable governor will eliminate 75% of the usual repairs, reduce consumption of gas and oil, and keep the truck always ready to do the owner's bidding.

One Truck on the Job Is Worth Ten in the Repair Shop

The Pierce Governor, through its automatic and perfect control of the motor, prevents the troubles that put trucks in the repair shop. Supplies just the right amount of vapor to the motor, permitting the driver to get full power at all speeds up to the danger point, and shuts off the power when that point has been reached.

Can be adjusted for any desired speed.

Used by 57 Prominent Truck Manufacturers
Demand a Pierce Governor on the truck you buy

PIERCE GOVERNOR COMPANY
World's Largest Governor Builders.
ANDERSON, INDIANA, U.S.A.

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INDIAN

—a tire that backs the Guarantee

Much is heard now-a-days about guaranteed mileage in motor truck tires. In their anxiety to succeed some manufacturers have gone to extravagant mileage claims for their tires. And the results have been disastrous.

Not so with Indian Tires. The men behind the Indian realize that a mileage guarantee is only as good as the tire behind it and have made that policy a stepping stone to success.

Indian Tires, though only recently introduced have deeply impressed those who have watched them perform in every phase of motor truck service. They are guaranteed to give as much mileage as any tire made, and more often than not they give more. It is the quality of the material put into them that does it.

INDIAN TIRE & RUBBER COMPANY

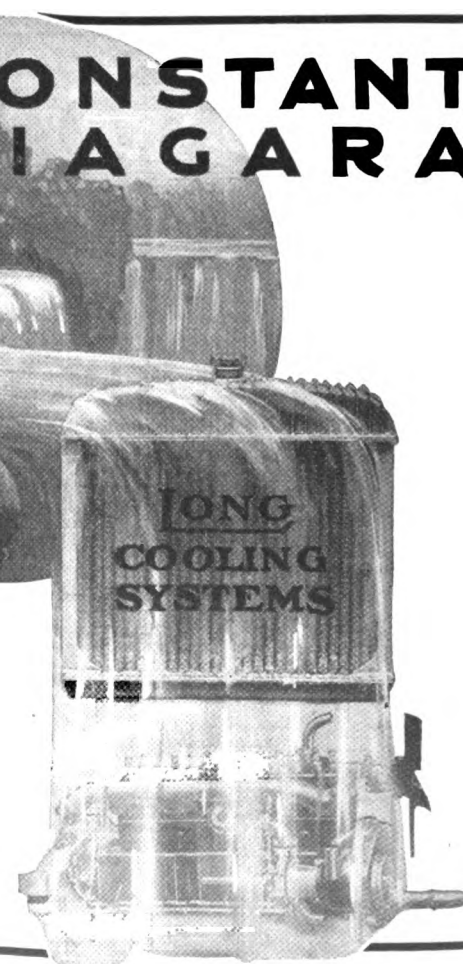
New Brunswick **New Jersey**

LONG

for

MOTOR CARS MOTOR TRUCKS AND TRACTORS

AS CONSTANT AS NIAGARA



Long Cooling Systems perform a greater service and give greater assurance of perfect radiation than you can reasonably expect of the common radiator. Each Long Cooling System for each motor is designed to order. Each step in creating the design is taken in co-operation with the Engineering Departments of our factory and those of the manufacturer. Proper design insures proper construction. By reason of this co-operation, we attain minimum cost and maximum efficiency.

LONG MFG. CO.
DETROIT, MICH.

Pioneer Makers of Gasoline Engine Cooling Systems

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D-E-S

DAY-ELDER MOTORS CORP. D WORM DRIVE E NEWARK·N·J·U·S·A·

WORM-DRIVE MOTOR TRUCKS

What Does It Mean to You?

What does it mean to you to have the representation of a line of Motor Trucks in your community that no other motor trucks in their class can equal? What does it mean to you to be able to approach your prospects with the positive certainty that no other truck any one else may offer him is as great a value as the ones you offer?

It means EVERYTHING to you to have such a line of Motor Trucks. And that is exactly what we offer YOU in D-E WORM-DRIVE Motor Trucks.

¾ Ton, $975 1 Ton, $1375 1½ Tons, $1600 2 Tons, $2100

And when YOU know how D-E WORM-DRIVE Trucks are BUILT, and what goes INTO them, you will agree that they are the most attractive propositions in America today. No truck built has a better motor; or a stronger frame; or a more reliable clutch or transmission than you will find in D-E Motor Trucks. Their WORM-DRIVE REAR AXLES are the admiration of everybody.

Let us send you detailed specifications and our liberal dealer's proposition. A wire will bring it quicker. Do it NOW.

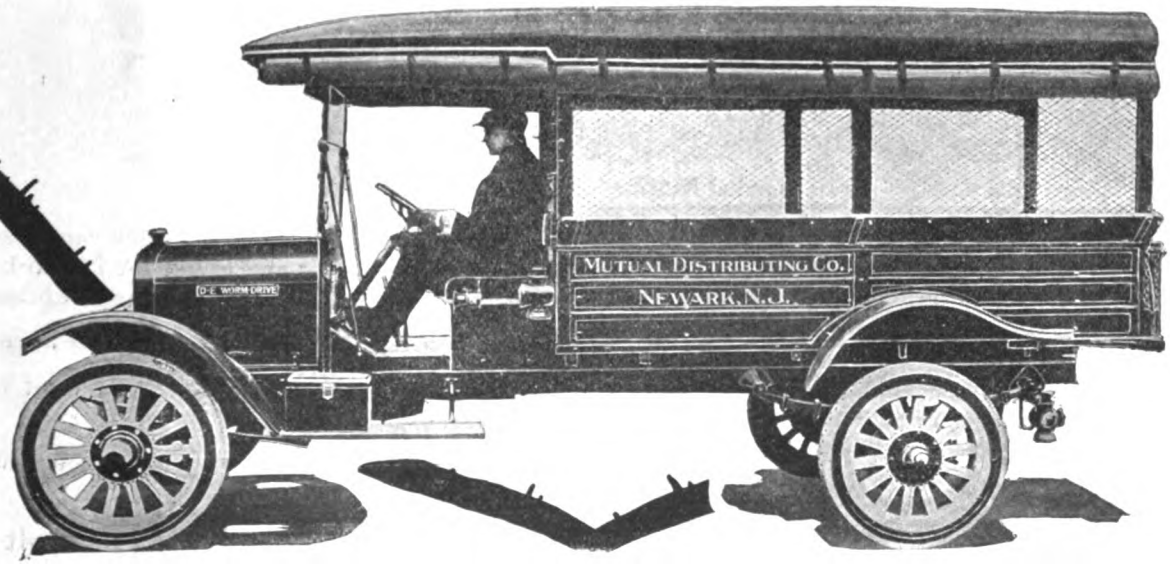
GENERAL SALES OFFICES: 1459 Broadway, New York City

P. K. Hexter, Sales Manager

DAY-ELDER MOTORS CORP.

MANUFACTURERS OF D-E WORM-DRIVE MOTOR TRUCKS

165 Ogden Street **NEWARK, NEW JERSEY, U. S. A.**



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ABOVE the clouds with a two-ton load—not once only but many times. For days, continuously, this great Wilson truck climbed and reclimbed these terrific grades to a point on famous old Pikes Peak, 14,109 feet in the air (the highest roadway in the world).

The impressiveness of this amazing Wilson performance will not be duplicated for some time to come—perhaps never. Through the rocks and boulders of mountain trails, up grades that only trucks of Wilson worth could hope to travel, the pure brute-pull of the wonderful Wilson motor won its way with a two-ton load.

And after days of such labor this truck came back from the mountain tops fit and sound for its work on the pavements of Denver. There it is still working.

This, we take it, is the sort of truck *you* are interested in.

This is the sort of *proven* power you want for your transportation department.

May we send you full details of the Wilson Truck and its wonderful achievements?

The J. C. Wilson Co., Detroit

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We can now offer you the most attractive dealer proposition of which you have ever heard.

Our proposition means you will no longer be forced to "hold the bag." You can make money, and plenty of it.

We can show you motor truck dealers a new angle in motor truck selling.

We can show you pleasure car dealers how you can double your net income without the addition of a single dollar to your non-productive overhead expense.

The Wilson dealership will establish for you a growing business that will be permanent, profitable and easy to care for.

Trucks

One, Two and Three and a Half Tons, Semi-Trailers.

The Wilson scientifically-developed semi-trailer system will enable the Wilson dealer to demonstrate to the truck owner how to cut in half haulage costs.

This system is not merely a body on two wheels attached to the truck. It is a mechanically correct hauling apparatus.

Let us tell you the complete details.

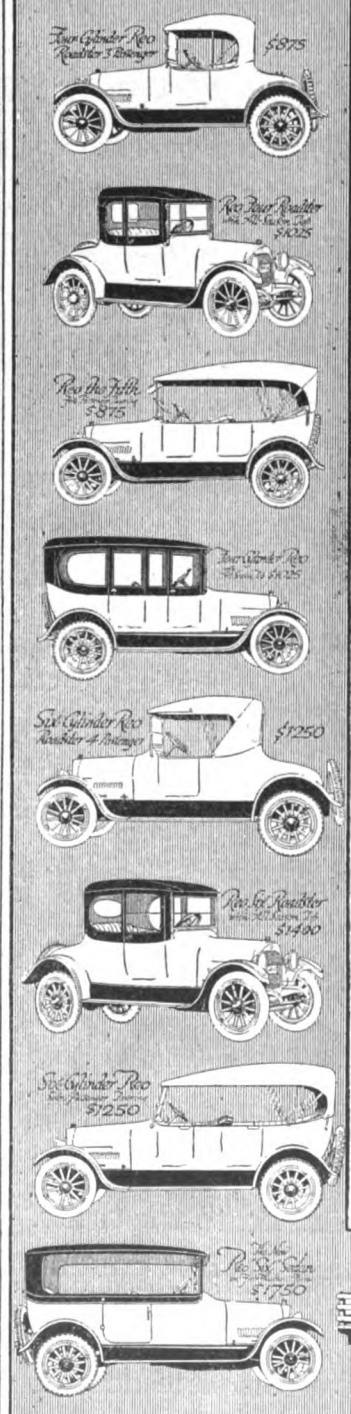
Write for Book "A"

The J. C. Wilson Co., 486 Warren Avenue Detroit

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Reo

Get Your Reo Now —It Is Imperative



AGAIN WE CAUTION YOU—as we did last April and the year before and each year before that—that there won't be, can't be, enough Reos to go 'round. Many must be disappointed.

THAT ONLY THOSE who order now and take delivery as soon as the local dealer can supply them, can hope to be numbered among the "Lucky Ones" who will drive Reos this season.

APRIL ALWAYS BRINGS the biggest demand of the year—the big Spring demand starts then. May and June only accentuate it.

OBVIOUSLY, it is impossible for any factory to manufacture in those months enough cars to fill the orders that dealers will book in that period.

IN THE CASE OF REO, it has never been possible for us to make enough cars in the Winter months to supply the Spring rush.

IN FACT, NEVER since the first Reo left the factory has there been a time when it was possible to make enough cars to supply all who wanted Reos.

OF COURSE WE COULD have more nearly caught up with the demand, did not the Reo policy prevent. Were we, in short, willing to sacrifice quality in favor of mere quantity considerations.

FINANCIALLY, REO IS one of the strongest concerns in the world. Among manufacturers the Reo plant is regarded as the "Model Automobile Factory."

SO YOU SEE there's no obstacle in the way of large quantity production, save that which we have deliberately placed there ourselves.

THAT REO POLICY, established at the inception of Reo, has never been changed. Exigencies of the moment influence that plan not at all.

WE REO FOLK are not, never have been, ambitious to make all the automobiles—only the best.

MERE VOLUME does not appeal to us. We covet a reputation that to our way of thinking is far beyond that.

THE QUALITY THAT IS REO is the result of that policy. And it is also the cause of the effect that manifests itself in the form of a constant over-demand — a demand for Reos of all models, that is almost hopelessly in excess of the factory output.

THAT YOU KNOW Reo Quality —that it is splendidly appreciated by motorists generally—is amply evidenced by that very demand.

SO AT THIS TIME, 'twere a waste of words to tell you more of Reo quality.

OUR MESSAGE TO YOU—a suggestion of most vital import at this time—is to delay not another day the selection and ordering of your automobile.

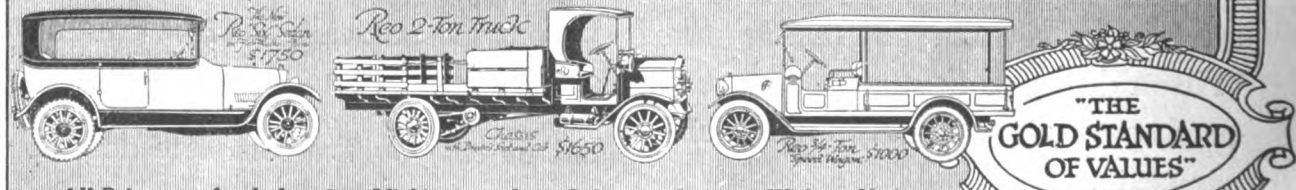
AND IF YOU'VE DECIDED to cease experimenting and buy a Reo, see to it that your Reo dealer is advised in the form of an actual order—else you may again be disappointed.

THERE WON'T BE—can't be, enough Reos to go 'round. Reports from Reo Dealers everywhere tell the same story, sound the same warning.

SO DON'T DELAY—today won't be a minute too soon.

Reo Motor Car Company

Lansing, Michigan



"THE GOLD STANDARD OF VALUES"

All Prices are f. o. b. Lansing, Michigan, and are Subject to Increase Without Notice

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Traffic FEDERAL News

APRIL 15, 1917



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Refined FEDERALS Well Received by New England

THE 1917 Boston Show is history. New England came and saw and bought.

Sentimental pride in New England traditions is a feeling generally held by citizens of that section. This is true of commercial life as well as in every day affairs.

That is why the story of "New England Federalized" as told in the March Issue of TRAFFIC NEWS particularly appealed to the folks there.

It is the main reason, we believe too, that the new and complete FEDERAL line was so favorably received. It was apparent at a glance through this issue that FEDERALS are both a tradition and reality in this section.

The Boston Show this year was the largest and best automobile and truck exhibition ever held in the hub city. Thousands and thousands thronged the halls of Mechanics and Horticultural Halls and the Salon exhibition at the Copley Plaza.

In the basement of the Mechanics' Hall was located the truck section. Here were gathered the exhibits of thirty truck manufacturers. Every capacity, from one-half to seven tons, was shown; trailers too were to be found in numbers.

The FEDERAL exhibit was located at the foot of the main stairway, and was one of the chief centers of interest because of the new features embodied in the various units of from one to five tons capacity.

FEDERAL dealers from all over New England and the East were present because they too were interested in the complete line of FEDERALS exhibited for the first time with all of the various refinements and features.

None were disappointed.

Truck users and dealers in this territory are inclined to be conservative, and the announcement of the FEDERAL complete line as made at the Boston Show, has only proven this assertion because thousands of FEDERALS operating in New England have convinced business men who are interested in motor haulage that the name FEDERAL stands for inbuilt quality and efficient service.

There were more actual sales consummated at the Boston Show than at any other big show this year. One reason for this, perhaps, is because New Englanders even if they attend the New York and other shows wait until their own exhibition before attaching their names to the dotted line.

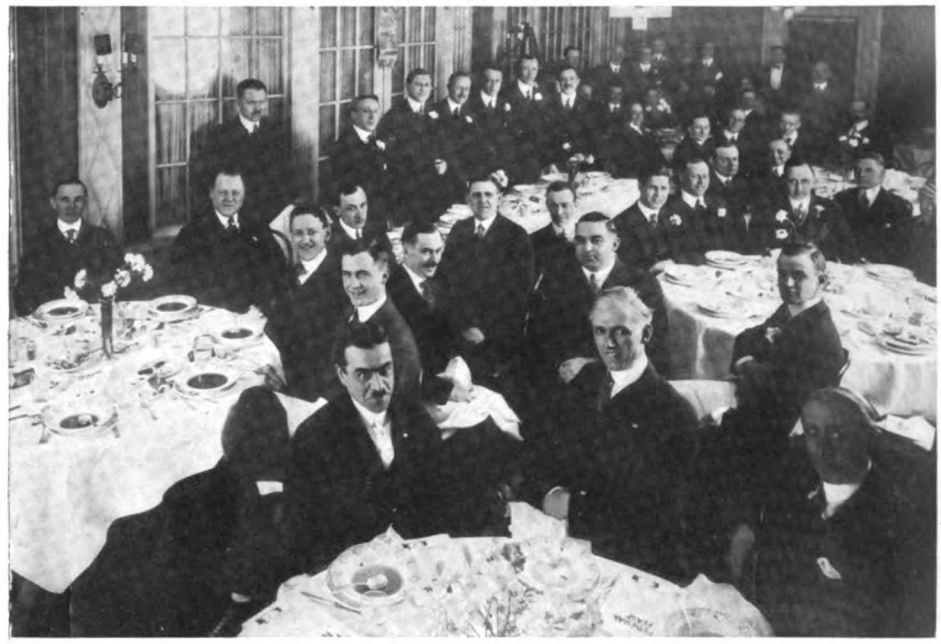
The New Englander has many virtues in business life. He is difficult to convince that a change in the established mode of things is advisable, but once he has made a decision that idea is based upon careful thought and not upon the impulse of the moment.

With a foundation of this kind based on confidence in the FEDERAL, it is easy to understand why New England buys more FEDERALS than any other section of the country of like size, and why more FEDERALS were sold here than at any other show this year.



New York City Buys FEDERALS for Park Service

New England Dealers at FEDERAL Banquet



THE photograph above shows the gathering of 43 New England dealers, salesmen and factory representatives at the Hotel Lennox, Boston, on Friday evening, March 9.

Director of Sales, J. F. Bowman acted as toastmaster and told the Federal men that the gathering was for social purposes and good fellowship and also to hear more about the Federal 1917 line; then General Manager, M. L. Pulcher, told the New England folks about the new series which was being shown for the first time at the Boston Show, explaining that it was with a great deal of pride the Federal Company could offer them the present line for distribution among their clients.

He explained the efforts of the company to produce a line of trucks which would continue to meet with the popularity which had been accorded the FEDERAL line since its inception several years ago. He said "We offer you today a complete line of models from one to five tons, with a power plant which will give more mileage without overhauling than any other motor in existence, and which will be second to none in power and one that will give more economical mileage than any truck yet designed.

"Additions to the factory make it possible to materially increase production and shipping facilities. Railroad sidings have been extended and new assembly space provided.

"We have just built additions to incorporate a new Service Stock Room, giving more room for bins containing parts, and operating to speed up your requests for service parts, helping you to give more satisfaction to present owners.

"Because of FEDERAL past performances in your localities," continued Mr. Pulcher, "getting orders for these five models is going to be easier than ever before, because the people are going to come to you for them, and you may be sure they are going to stay sold after you have placed them in the owners' hands."

Following Mr. Pulcher's talk, engineers were heard on the technical phases of the line and dealers were allowed to ask questions as they desired.

A great deal of enthusiasm was manifested over the parts board which was shown at the banquet with the principal features of the FEDERAL line and motor displayed. Those in attendance at the banquet were as follows:

M. L. Pulcher, Vice-President and General Manager, Detroit
J. F. Bowman, Director of Sales, Detroit
H. A. Conlon, Field Sales Manager, Detroit
L. B. Dudley, Advertising Manager, Detroit
E. A. Haskins, Service Manager, Detroit
A. A. Geisel, New England Sales Manager, Springfield
B. F. Wright, Chief Engineer, Detroit
G. F. Knowles, Manager Production, Detroit
W. Ward Mohun, Detroit, Mich.
C. E. Mason, Detroit
A. E. Van Campen, Boston
L. S. Kellogg, Providence
P. C. Bennett, Detroit
C. Ballough, Canton
O. J. Strayer, Canton
Geo. Kannelly, Worchester
W. S. Hill, District Sales Manager, Buffalo
G. B. Chapman, Boston, Mass.
R. E. Arter, Providence, R. I.
R. M. Sauers, Springfield, Mass.
Allan R. Pye, Hartford, Conn.
George H. Ludlum, Newark, N. J.
Fred T. MacCrea, Newark, N. J.
John Cunningham, Rochester, N. Y.
Gerald Cox, Rochester, N. Y.
John Barzee, Syracuse, N. Y.
Roy R. Danford, Buffalo, N. Y.
J. L. Carpenter, Bridgeport, Conn.
S. F. Yudkin, Ansonia, Conn.
A. H. Santa Maria, Philadelphia, Penna.
R. S. Heebner, Lansdale, Penna.
H. R. Sackett, Springfield, Mass.
W. L. Caulkins, Middletown, Conn.
W. H. Spear, Manchester, N. H.
W. B. Gibson, Manchester, N. H.
C. E. Whitten, Lynn, Mass.
Harry Whitten, Lynn, Mass.
P. A. Borton, Worcester, Mass.
John Manley, Brattleboro, Vt.
C. O. Britton, Hartford, Conn.
C. S. Sprague, Middletown, Conn.
L. E. Harmon, Boston, Mass.
W. E. Lutts, Boston, Mass.
N. T. Carney, Boston, Mass.
Louis Schupp, Albany, N. Y.
Albert B. Ijams, Baltimore, Md.
John R. Pendleton, Washington, D. C.
J. N. M. Magna, Holyoke, Mass.

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This Month's Cover

FEDERAL Flag Among the Eagles

THE cover of this month's TRAFFIC NEWS shows A. W. Savage of the White-Savage Company, Salt Lake City, on the highest point of the Grand Canyon in Yellowstone National Park.

It is a fact that the sun never sets on FEDERAL trucks. They are operating all over the world.

A. W. Savage of the White-Savage Company, FEDERAL distributors of Salt Lake City, is a man who does things with a big "D." His slogan is "Do it now."

It was not for personal renown that Mr. Savage decided to carry the FEDERAL Pennant to the top of the highest peak of the Grand Canyon of the Yellowstone.

He has driven FEDERALS throughout this mountainous section and up over the rocky trails, until he has proved to himself and the residents in that section that FEDERALS are worthy of the confidence placed in them. So he made the trip up into the Park in a 2-ton FEDERAL and carried the FEDERAL Flag to this peak shown in the picture.

It is 2,000 feet straight down from the point where he stands to the waters of Yellowstone River. "A wonderful view is afforded," says Mr. Savage, "at this point and dozens of baldheaded eagles can be seen soaring hundreds of feet below."

He adds that the picture was made from a point nearly 200 feet away, being the nearest point to the crag on which he stood, on which the camera man could obtain a foothold.

Japanese Farmers' Business Demands Motors

Increasing Sales to these Western People Necessitate Japanese Salesman on Coast

IT is well known that Japanese are an industrious people and in various lines of business in which they are engaged on the Pacific Coast FEDERALS have played an important part.

The Pacific Kissel Kar Company, FEDERAL distributors in Los Angeles, found it necessary to engage a salesman to carry the FEDERAL idea to these Japanese gentlemen.

Mr. T. Takagi had handled for some time a competing line of delivery cars in that city and our distributors had heard from him in many localities as being an energetic and conscientious salesman.



T. Takagi, FEDERAL Salesman for Los Angeles

Mr. C. F. Hewes of the Pacific Kissel Kar Company at Los Angeles sent for him and asked him if he was open for a proposition to sell FEDERALS. He jumped at the chance and is now one of the best salesmen on the coast for the FEDERAL Company.



Okuhira Produce Co., Los Angeles, Cal.

"Mr. Takagi is a high-class Japanese gentleman" says Mr. Hewes, "having a splendid education and counting among his acquaintances some of the most prominent people of Japan. At various times he has brought some of the Japanese notables from some of the largest cities in Japan to visit the Pacific Kissel Kar Branch, and has shown them around and they have been very interested in the FEDERAL line.



Greeting Card and Folder Used in Getting Japanese Business

"Mr. Takagi is a hard worker, alert, quick to grasp and alert to everything that means a benefit to the FEDERAL line," says Mr. Hewes. "For instance, through his correspondence he obtained copies of various Japanese Trade Papers and therein discovered advertisements for FEDERAL motor-trucks which the factory is placing in Japanese papers.

"Further, Mr. Tagaki prepared for us many circulars in Japanese which have resulted in many sales. He is a broad-minded man, and the Pacific Kissel Kar Branch expect splendid results from him."

We show herewith one of the postal cards sent out to Japanese firms at New Years by Mr. Takagi. The translation is as follows:

"Happy New Year. We wish you Success and beg of you further favors. Pacific Kissel Kar Branch, Greatest Automobile Firm, Corner 10th and Olive St."

Also we reproduce a cut of another folder, one of a series of five, which Mr. Takagi has gotten out.

The translation of this folder is on hand in our office, and any of our readers who desire to read it may obtain copies.

The Only Large Neutral Country in Europe Sends Pictures of FEDERAL

Pictures From War-Torn Europe and Stories About the Work of Trucks are Impossible to Obtain at Present. Below We Show a Picture of a FEDERAL Job in Barcelona, Spain



A LETTER recently received from the FEDERAL Dealer in France stated that they had obtained many splendid pictures of FEDERALS operating under the difficult conditions of war times, but of course could not forward these photographs to us.

Recently arrived is the photograph of the FEDERAL in the service of the Refineria de petroleo y Gasolina Gijon.

This truck is owned by a gasoline and oil refinery near Barcelona and is used to haul the cans of gasoline, which may be seen loaded on the truck in the picture. The body is one of a special design with high sides, so made to hold as many of the wood encased cans of petrol as possible.

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FEDERALS in Farm Service are Becoming a Necessity for Marketing Food Stuffs

IN last month's TRAFFIC NEWS we told how C. W. Andrews of Waltham, Mass., and the Benvenuto Farm at Bloomfield, Conn., found FEDERALS essential to marketing milk in New England.

This month we would like to tell you another phase of the farm industry in which FEDERALS are making good.



This FEDERAL Saves Yeagle Four and One Half Hours Every Day

Down at Nursery, Mo., about twenty-five miles from St. Louis, is the farm of L. Vasel, gardener. Mr. Vasel's son is eighteen years of age, and he takes entire care of the truck which is utilized to haul vegetables and fruit to the market in the city.

Mr. Vasel says, "I can gladly say that my FEDERAL saves myself and horses from many hours of work in my line of business. Before I purchased this truck I was compelled to go to market with the team, which took from six to seven hours, and often robbed me of a good night's sleep. Now we can make the trip in two and one-half hours.

"This FEDERAL was purchased June 10, 1915—Truck No. 3106—and has never had ten cents paid out on repairs for it."

By being able to reach the market in much less time than with the old method, Mr. Vasel is able to do much work on his farm that he otherwise would not have been able to do. Therefore the work has been speeded up just that much more, enabling him to raise more vegetables, increasing his income as well as relieving him of much of the drudgery of farm life.

Mr. Vasel adds in concluding his letter, "I must say I am well pleased with my FEDERAL. If I purchased another Truck the FEDERAL would be my choice, of course."

Now let us travel quickly from Missouri over to Pennsylvania and come to the little town of Eddington, where are located Maplebrook and Brookfield farms owned and operated by J. E. Yeagle & Son.

On a typical down-east farm, with a beautiful frame farm house, painted a glaring white with green blinds, lives the family of Yeagles.

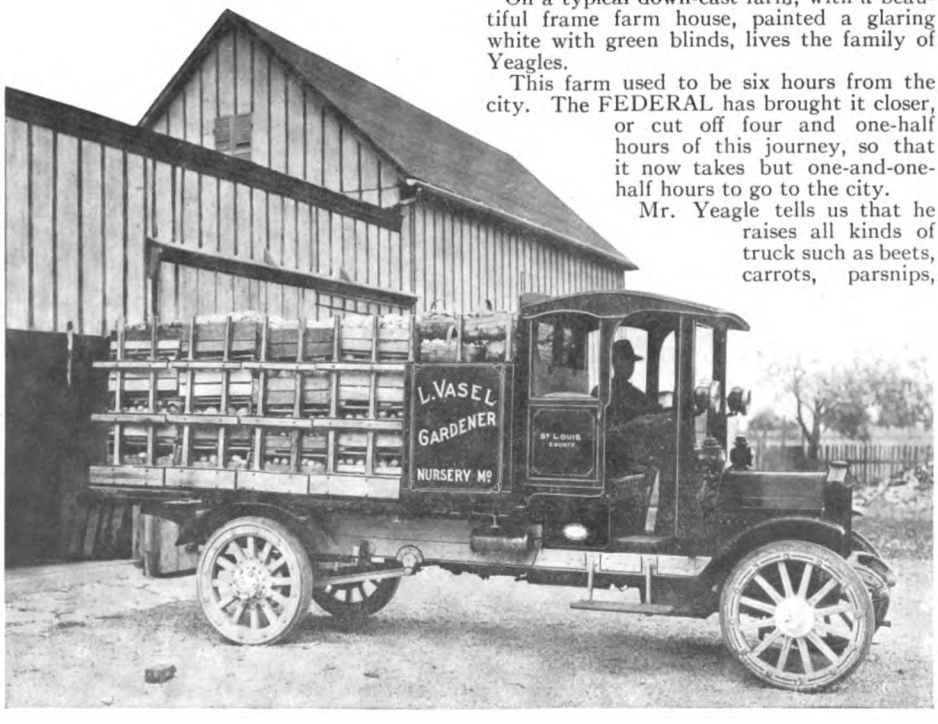
This farm used to be six hours from the city. The FEDERAL has brought it closer, or cut off four and one-half hours of this journey, so that it now takes but one-and-one-half hours to go to the city.

Mr. Yeagle tells us that he raises all kinds of truck such as beets, carrots, parsnips, horseradish, etc., and hauls it usually in barrels and bags to the city market 21 miles away.

As can be seen from the picture accompanying this story, every available place on the big 3½-ton truck is loaded. Mr. Yeagle says he does not make any trips with a part load but has even carried 150 bushels of potatoes at a time.

In the summer time it is necessary to make daily trips, in the winter, however, three or four trips a week are sufficient.

Mr. Yeagle tells us that he is very well pleased with the FEDERAL and believes that all who purchase the same kind of truck will feel the same as he does. In other words he has the confidence that the FEDERAL is making good for others as it has for him.



This FEDERAL Takes L. Vasel's Produce to Market in St. Louis, Mo. Without Robbing Him of Sleep

Hauls Food for U. S. Cadets

TO some, the lettering on the accompanying picture of the FEDERAL 1½-ton truck would be ambiguous, but when you understand that it means United States Cadet Corps, and that it hauls food for the Cadet Mess, then you will know that it is an important item in the training of United States soldiers.

The FEDERAL is used for carrying goods for the Commissary Department from the dock and trains to the Academy. It is also used to carry the cadets' laundry.

There are more than 700 cadets at the post and the youngsters have appetites which would shame an anaconda, as they used to say. After the drills these fellows come in almost starved, to the mess table, and you can possibly imagine the amount of food it takes to supply the table for these healthy young Americans.

The FEDERAL carries the entire food supply for the 700 cadets, as well as all the laundry which is required for their rooms.



This One and One-Half Ton FEDERAL is Operated by the Commissary Department of the United States Military Academy, at West Point, New York

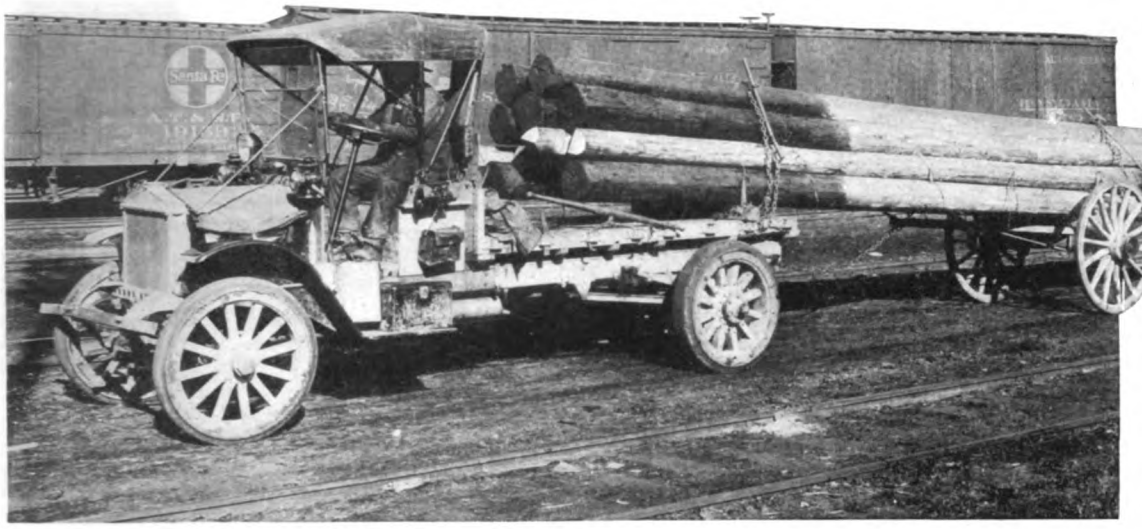
This truck was selected by the Academy Board because of another FEDERAL which came directly under the notice of Colonel Esser who is in command of the Cadet Mess and Commissary Department.

The choice was made of a FEDERAL because of its neat appearance and the punctuality of the FEDERAL which hauls milk to West Point every day since it has been put into commission. This first FEDERAL is owned by a private party under contract to the Government, therefore there are today two FEDERALS operating in the interest of West Point.

Both FEDERALS were sold by Youngs & Company, Newburgh, N. Y., who had this picture taken. Mr. A. Youngs of this company adds: "The heavy snows we have had in this locality have not deterred these FEDERALS from operating on schedule time."

The picture accompanying the story shows the truck in deep snow on its way to the depot for its load of supplies.

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Motor Trucks Are Railroad Auxiliaries

Haulage is only a "means of moving"—yet it is vitally essential to progress. Long hauls can be made cheaper and faster on tracks—but tracks don't go everywhere. There the motor trucks come in—and the need of the Nation today is "More Trucks."

Trackless Transportation—The Mobile Truck

Big Public Service Companies Find FEDERALS Can Go Where the Business Is—And That's Where They Send Them

IN these days of uncertainty regarding railroad facilities, liability of strikes, etc., motor-trucks are fast coming to the fore in the service of large companies.

Motor-trucks are far more mobile than railroads. Car freight must go on a given route to a fixed destination, while trucks can instantly expand their delivery radius and operate in new territory.

If you have ever been in Pueblo, Colo., you probably are forming a mind picture of the famous Harvey lunchroom and the plant of the Colorado Fuel & Iron Company, for which that city is noted. Visitors in the future will find it strongly FEDERAL-ized, many orders having been placed by the Pueblo Auto Co., of late, for FEDERALS for Armour & Co., Wells Fargo Express Co., and Colorado Fuel & Iron Company. The latter now has four FEDERALS in service there.

Colorado Power Company Find FEDERALS Efficient

The above picture shows a FEDERAL 2-ton truck owned and operated by the Colorado Power Company of Denver.

Right under the noses of the great through lines of transportation, this FEDERAL hauls equipment for the big power company which makes light for the beautiful western city.

With this truck a trailer is used to enable the long lighting poles to be carried from the railroad yards to the new power lines which are being extended.

We could go on indefinitely furnishing instances of similar character in which FEDERAL haulage equipment is making good in strenuous service for big corporations on which the public depends.

There is a real reason for their saying so frequently "ANOTHER FEDERAL."

Large express companies are coming to use trucks in larger quantities as they realize their efficiency for distributing perishable and valuable goods quickly.

The picture shown herewith is of four FEDERALS in the use of the Wells-Fargo & Company Express at Baltimore. These are Nos. 4713, 4752, 4753 and 10422. They are kept so busy on the route delivering packages that it was with very great difficulty this picture was obtained. In fact, we are indebted to the Wells Fargo Company for holding them long enough for the picture to be taken. They were sold by The Commercial Motor Company of Baltimore, Md.

Another large concern motorizing their haulage wherever possible is the Standard Oil Company. We reproduce a picture of truck owned by Burt Elliott of Knightstown, Indiana, who is under contract with this company.



Doubled his Business at Less Expense

Mr. Elliott writes us as follows: "I must say that I am more than pleased with my FEDERAL. I have doubled my business on less expense per month than I paid for horse equipment.

"I have been thinking I would send you a record of one month's work of this FEDERAL truck. As the weather and roads have been very bad I could not keep as accurate a report as I would like, but in the near future I will send you a complete account of mileage, expense and income for one month.

"I would like to add that if I were to buy a dozen trucks they would all be FEDERALS."

The Standard Oil Company owns and operates a great many FEDERALS, as well as contracting, as in this case, for deliveries in FEDERALS with outside firms.

Return Postal Card Enclosed If You Desire to Receive TRAFFIC NEWS Regularly

THE circulation of TRAFFIC NEWS has been growing by leaps and bounds.

In one year the number of copies printed has had to be doubled and tripled.

Obviously, with a large mailing list such as this there are a good many waste copies.

Because of the high cost of paper, and the kind of printing we insist on putting into TRAFFIC NEWS, it is now necessary to eliminate all copies which are going astray.

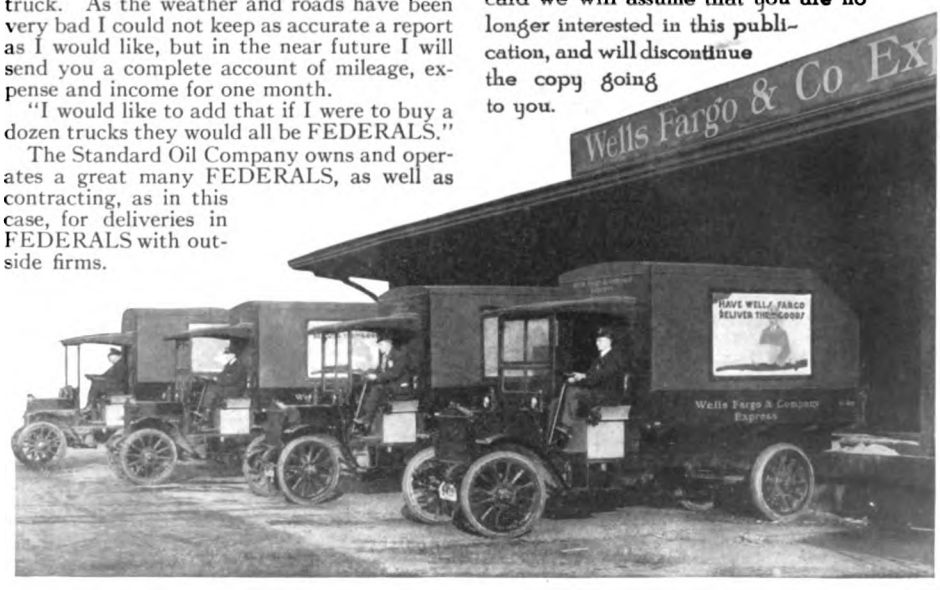
Also on large lists such as TRAFFIC NEWS there are oftentimes duplications—some persons are receiving two copies.

Therefore, it has been necessary to adopt the following plan:

TRAFFIC NEWS will hereafter be mailed only to those friends of the FEDERAL who signify their desire to receive it. We know it will be a little bother for you to fill out and return the postal card, but we believe that this action on your part will signify your appreciation of our efforts. The following questions appear on this card:

1. Do you wish to continue to receive TRAFFIC NEWS regularly?
2. Are you receiving more than one copy of TRAFFIC NEWS?
3. Would you prefer to receive TRAFFIC NEWS occasionally instead of regularly?

Please note that if you do not return the card we will assume that you are no longer interested in this publication, and will discontinue the copy going to you.



These Four FEDERALS Serve the Public Through the Wells Fargo at Baltimore

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FEDERAL

Published in the interest of
ECONOMICAL TRANSPORTATION
by the
FEDERAL
MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

Edited by: L. B. DUDLEY : Advertising Manager

EDITORIAL

Motor Truck Records—The Best Forms to Use

THE average business man of today fully understands the necessity of keeping an accurate tab on the daily operations of his haulage and delivery units.

However, the form of these records has troubled many and in fact is responsible in a way for the failure of many to keep an accurate Daily Record.

A good driver is very seldom a good bookkeeper. Therefore, it is necessary to install a record system that, as far as the driver's part is concerned, requires very little, if any, knowledge of bookkeeping.

Another item that enters into the question of the best form to use is the kind of work done by the truck.

Various Forms for Various Lines

For instance, a truck operated in the meat packing industry requires a different form from one delivering for a bakery firm.

Probably a form suitable for either of these two lines would not be kept for use in the hardware, grocery or other line of business.

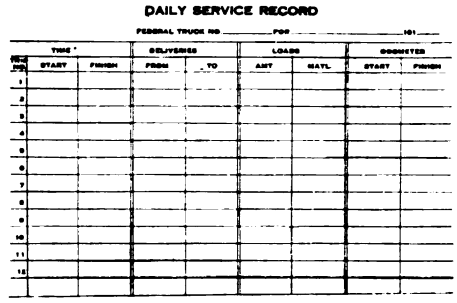
These facts have made it very difficult to arrange a record form that would be adopted by all as a standard form.

The Traffic Engineering Department of the FEDERAL Motor Truck Company has taken these facts into consideration and endeavored to arrange forms that could be suitable for the various kinds of business.

We want to explain a few of these forms here—we will gladly furnish any of these forms to the FEDERAL Owners free of charge.

If your requirements are not met by any one of these forms, write us, possibly our Traffic Engineering Department can suggest a form that will be the right one.

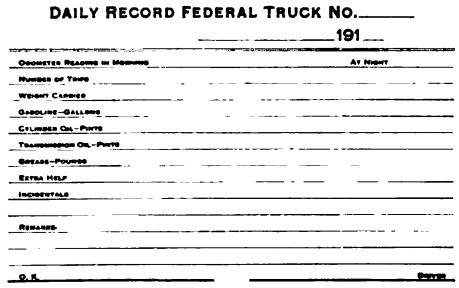
Hammond Standish Company of Detroit, used Form No. 20, and the cut is a reproduction of one record of a busy day last year.


DAILY SERVICE RECORD

Form No. 30—General Use—Short Trips

It shows a total of 35,580 pounds of meats delivered in ten hours, with gasoline consumption only ten gallons.

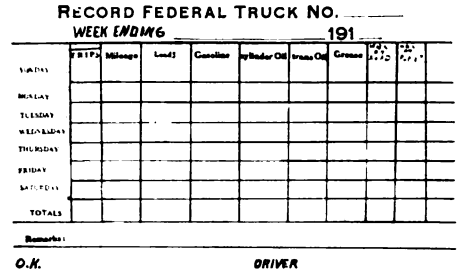
Form 30 provides an account of items shown for 20 trips each day, having on the reverse side, space for eight trips and also for mileage per day, gallons of gasoline, pints of


DAILY RECORD FEDERAL TRUCK NO.

Form No 57—For Transfer Business

cylinder and transmission oil, and pounds of grease used, besides space for Remarks, Driver's signature and Superintendent's O. K.

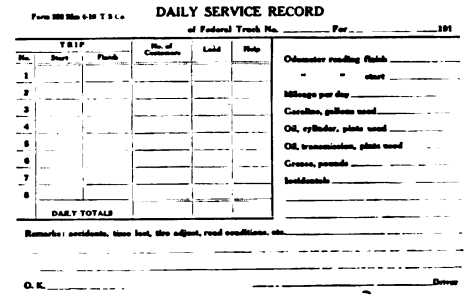
It gives a very detailed report and has been used in several different vocations such as


RECORD FEDERAL TRUCK NO.

Form No. 60—Suggested for Weekly Expense Reports

bakery, wholesale and retail groceries, hardware and manufacturing.

The general reason, or excuse, for not keeping daily records in this line of business is that they take too much time to fill out and on account of the widely varying loads, they cannot be used. Form 57 can be easily filled out each night by the driver, and while it does not give a detailed account, it provides a good record of the day's work.


DAILY SERVICE RECORD

Form No. 253—A Good Standard Form

Many firms require only a weekly report from the driver. Form 60 covers all the items usually taken into consideration. It is a little smaller in size than the other records, but covers the work of the week very nicely.

We have endeavored to arrange a form suitable for all vocations, and our standard Form No. 253 is more generally in use, we believe, than any other form. It entirely covers the day's work and yet does not require a bookkeeper to understand it.

Our Cost System Form Puts Records

From these records, whatever form is used, the FEDERAL Monthly Report sheet is drawn up. It is so arranged that it can be conveniently filed away in a loose leaf book—9½" x 6"—for future reference.

These reports have proven valuable aids in reducing operating cost and increasing the efficiency of delivery service.

Wm. Schluderberg & Son of Baltimore says—"This firm feels that it owes quite a debt to the FEDERAL Organization for the interest it has shown in the upkeep of our truck. We have obtained results that heretofore were impossible and we can conscientiously say that, due to the interest taken by your Traffic Engineering Department in the work of our chauffeur, we have at the present time, the most competent chauffeurs that are operating trucks in this city."

The Michigan Stove Company of Detroit says—"This information (Monthly Reports from Daily Records) is very satisfying to us, inasmuch as it indicates very thoroughly just what our trucks are accomplishing and we, therefore, solicit your further assistance in this regard."

Geo. A. Hormel & Company, Austin, Minnesota, says—"These Daily Service Records are to our mind a very good form and we do not know of any way that we might improve upon them, as they seem to give all the information necessary to the proper handling of trucks, at least in our business."

DAILY SERVICE RECORD

of Truck No. 108 For 2 - 15 1916

TRIP No.	Dock	B. Hse.	Finish	No. of Customers	Load
1	5 40		6 45	East Market	3500
2	7 00		8 00	Booths Storage	4500
3				Del.	400
4	10 00			East Market	6800
5			11 45	2 Trips	6500
6		12 30	3 00	10	6880
7	3 30	4 45		From Car	7000
8					
7					35580

Odometer reading finish _____
" " start _____
Mileage per day 25
Gasoline, gallons used 10
Oil, cylinder, pints used 0
Oil, transmission, pints used _____
Grease, pounds _____
Incidentals _____
Helper Myers

Remarks: accidents, time lost, tire adjust, road conditions, etc.
Remade 11 30 - 12 30

O. K. W. C. C. J. Schauk Driver

Form No. 20—Used Successfully by Many Meat Packers

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"In honestly striving for a creditable performance you dignify your work and your daily accomplishments become a permanent record that can be pointed to with pride"

Detroit Water Commissioners Make FEDERAL Equipment Pay

THE phenomenal growth of Detroit in the last three years has more than doubled the population. At the present time over one thousand new citizens per week call Detroit home.

These throngs of new families have to have houses. New streets had to be cut through the then open fields. Whole townships have been annexed to the city. Extensions of water mains and sewers have been necessary on all these streets and this water had to be conveyed to the houses springing up on all sides. This was the problem—a problem still being worked out—that the Board of Water Commissioners have been forced to solve.

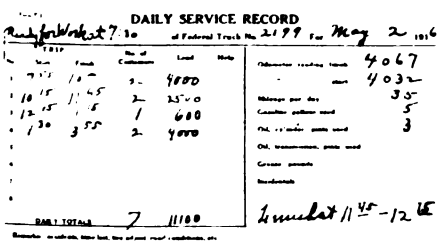
City Purchases a Truck

Late in the summer of 1914 and really at the beginning of this rapid growth, the Board of Water Commissioners were authorized to purchase a truck. After an investigation, Model "H" 1½-ton FEDERAL No. 2199 was purchased from the Thompson Auto Company, local FEDERAL distributors.

FEDERAL No. 2199 was delivered at the City Storage Yard, Erskine and Orleans, September 5th, 1914. Mr. L. J. Clancy, Superintendent of the Storage Yard, immediately put it in service. It was badly needed.

The First Record

Our Traffic Engineer suggested to Mr. Clancy that he keep a record of the truck. He saw the advantages of knowing what the operating costs were and we received the first record covering the work during December 1915, after the truck had been in service fifteen months.



DAILY SERVICE RECORD

Truck for Workshop 7 No. of Federal Truck No. 2199 For May 2 1916

						4067
						4032
10 15	11 45	2	35			35
12 15	1 15	1	60			5
1 30	3 55	2	4000			3
DAILY TOTALS		7	11100			

Remarks: Installed 11 45 - 12 15

W H C J Conway

During that month the truck traveled 907 miles, consuming 127 gallons of gasoline and 54 pints of cylinder oil. Their records showed a total cost, exclusive of driver's wages, of $82.56 for the month, averaging $3.18 per day, $.091 per mile and $.019 per tire mile.

Supt Clancy's Ideas of Truck Economy

Supt. Clancy understands the value of teaching the driver economy. January 24, 1916, he writes—"I have always believed, as you do, that the habit of economy taught to the driver by pressing him for low gasoline consumption (which he understands best) is a first lesson which ultimately encourages and spurs him to greater economy in those other and more important items of expense over which a driver has entire control."

He understands our purpose and also appreciates the work of the Traffic Engineering Department. A letter of March 13, 1916, states—"We take the opportunity as one of the many FEDERAL users, to express our appreciation of the efforts of the FEDERAL Company to increase the excellent service their product is already giving."



This FEDERAL Runs Nearly 1000 Miles Per Month For City of Detroit

Mr Conway on the Job

It was about this time that Mr. John Conway was engaged to drive No. 2199. He proved to be a live wire, always on the job and gave his FEDERAL the best of attention.

Driver Conway also displayed considerable interest in the Daily Service Records—a good driver always does. He filled these records out each day. To the left is reproduced a sample record—May 2, 1916.

Twelve Months' Work

Since Conway has been in charge of No. 2199 we have received records each month, missing but two during that time.

The total results for twelve months' operation were as follows:

Days in service	287½
Trips made	949
Deliveries	1852
Loads carried in tons	1279.62
Miles traveled	9958
Gallons of gasoline used	1755
Pints of cylinder oil used	678½
Ton-miles (half load basis)	6605.20

The Time Element

Aver. standing time per day	1 Hr., 43 Min.
Aver. running time per day	5 Hr., 58 Min.
Aver. standing time per del.	28 Min.
Aver. standing time at yards per trip	31 Min.

The Cost

The Fixed Charges covering the 287½ days' operations and including interest, insurance, driver's wages, taxes and license and garage rent, was $1097.67.

The Variable Charges covering the 9958 miles traveled and including gasoline, lubricants, repairs or maintenance, depreciation and tire allowance, was $708.01.

The average cost was—

Per day	$6.28
Per mile	.18
Per ton-mile	.27

Conway's Work is Appreciated

A good driver always attracts the attention of the owner. He is an invaluable aid in securing the most efficient and economical results from the truck.



John Conway

Supt. Clancy is a busy man but not too busy to realize the importance of a good driver, nor to recognize Conway's good qualities. A letter from Mr. Clancy, dated February 9th, 1917, reads:

"We study these records carefully in an effort to reduce our operating costs and are glad to say our driver, John Conway, also displays the liveliest interest in them.

"We assure you again we appreciate the effort your Traffic Engineering Department is making to improve a service that is already excellent."

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April Brings These FEDERAL Owners' Comments

Dohn, Fischer & Beyer, Buffalo, N. Y.—Lumber

"We are entirely satisfied with the results and therefore will not keep records any further as we are in close touch with the work the truck does and what we see every day convinces us that the service given is all that can be asked. It is satisfactory in every way."

Lyons-Delaney Company, Pawtucket, R. I.—Grocers

"We are well pleased with one year's service of 1½-ton FEDERAL. We have an order in for a 3½-ton displacing a.....3-ton. No knock on the.....but consider the FEDERAL just as good at a less price."

Richard Muirhead, Rochester, Michigan—Farmer

"We are glad to inform you that we are pleased with the FEDERAL. We went 32 miles from home to load a car load of hay. We started at 9:00 o'clock in the morning and finished at 6:00 in the evening. Our haul was 2½ miles over very poor roads. We consider this a good day's work "

Valley Oil Co., Middletown, Conn.—Gasoline and Oil.

This firm has been operating for some time a 2 ton truck of a competitive line. They purchased a 1½ ton 1912 FEDERAL Truck second-hand on which they mounted an oil tank and have been operating it against the truck mentioned, with the result that we have an order at the factory for a Model M truck with oil tank mounted complete for their services. We might say in connection with this circumstance that they have done as most others, when they need extra equipment they came looking for a FEDERAL.

South Penn. Oil Co., Noblestown, Pa.—Oil

"The truck certainly is doing good work. It does the work (conservatively speaking) of at least five teams. We have no speedometer on the truck, so cannot tell just how far it has run, but expect to get one in the near future."

Western Casket Co., Oakland, Cal.—Casket Manufacturers

"Five years ago we bought our first FEDERAL and turned it in about a year ago on our present truck. Our old truck gave us splendid service, so much so that we did not consider any other make when it came to purchasing a new one. The Pacific Kissel Kar Company have disposed of the truck we turned in, to a local storage concern and from reports that we have heard, it is still giving satisfactory service.

"We now have our second FEDERAL truck and our experience has been such that we believe the FEDERAL cannot be excelled."

C. W. Tryon, Meriden, Conn.—Road Building.

Their business was started with a 1½ ton 1913 Truck. Later they decided this was too small and invested in a Model L-12. This truck certainly is a recommendation for FEDERAL stability. The writer has been on this truck when in service on their jobs and has found them using same over roads on which they did not dare put their teams. This gives perfect satisfaction.

Daniel Cronin, New Hampshire—Scientific Forestry.

"The FEDERAL which I purchased of you has more than come up to my expectations. Have run same over all kinds of roads, carrying load of 2½-tons, without costing a cent for repairs. If I were to buy another truck it certainly would be a FEDERAL."

The Park Brick Co., Hartford, Conn.—Brick Manufacturers

"We have been very much pleased with the working of the truck, as we received it and put it to work at a time when we were unable to keep up deliveries with teams. We used it steadily for six months and it gave us perfect satisfaction."

Emmons L. Peck, Pleasant Mount, Pa.—Lumber

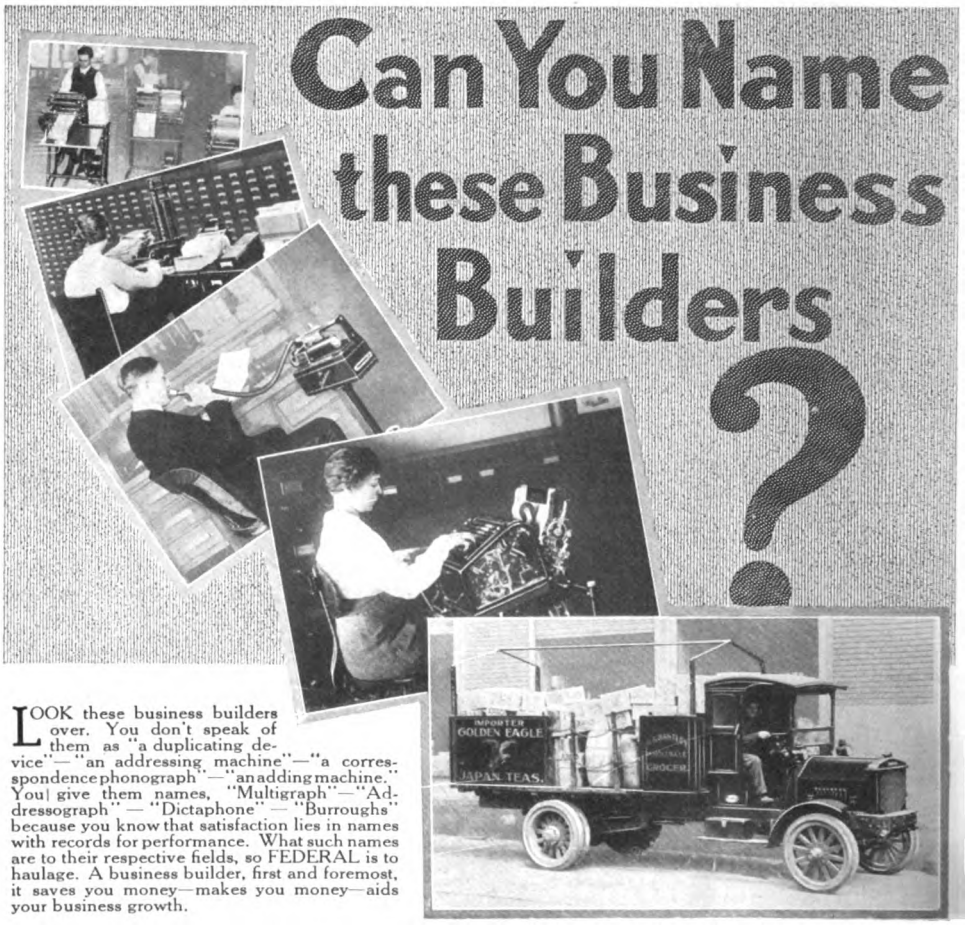
"Took our truck over to Carbondale, and it was a subject of remark there in the garage that the FEDERAL motor ran more quietly than any they ever saw, and in fact better than a lot of last year's automobile motors in the machines then in the garage."

Krueger Coal Co., Detroit—Coal

"You may be interested in knowing what our Federal truck did one day recently; for example, trip No. 1 started at 7 A. M. and finished at 9 A. M. In this time I delivered 1½ tons of coke to Longfellow Ave.

Trips 2 to 13 were from 20th St. to 17th and Myrtle to a coal dealer; at which time I delivered 30 tons, starting at 9:15 and quitting at 5:30 with 1½ hours off for noon. The 14th trip did not start till 6:15. This trip lasted an hour and 4,300 lbs. of coal was delivered to Woodward and the Boulevard.

My total tonnage for that day was 67,300 lbs., over 33½ tons. I think that was a pretty good day's work. This explains why I am satisfied with my FEDERAL."



LOOK these business builders over. You don't speak of them as "a duplicating device"—"an addressing machine"—"a correspondence phonograph"—"an adding machine." You give them names, "Multigraph"—"Addressograph"—"Dictaphone"—"Burroughs" because you know that satisfaction lies in names with records for performance. What such names are to their respective fields, so FEDERAL is to haulage. A business builder, first and foremost, it saves you money—makes you money—aids your business growth.

THE FEDERAL is a business builder because it meets the measure you apply it to. "Will it pay?" "What does it give for what it costs?" "Will it fit my business needs?"

Federal representatives expect these questions. They study your peculiar needs and answer you—in facts and figures of other men in similar lines of business.

They show how FEDERALS cut down overhead by cutting haulage costs—how FEDERALS do more in a given time—work longer hours whenever emergency requires—never need a rest.

They also show how FEDERALS widen your delivery field. Thirty—forty—fifty miles, or even more, are easy distances for daily trips.

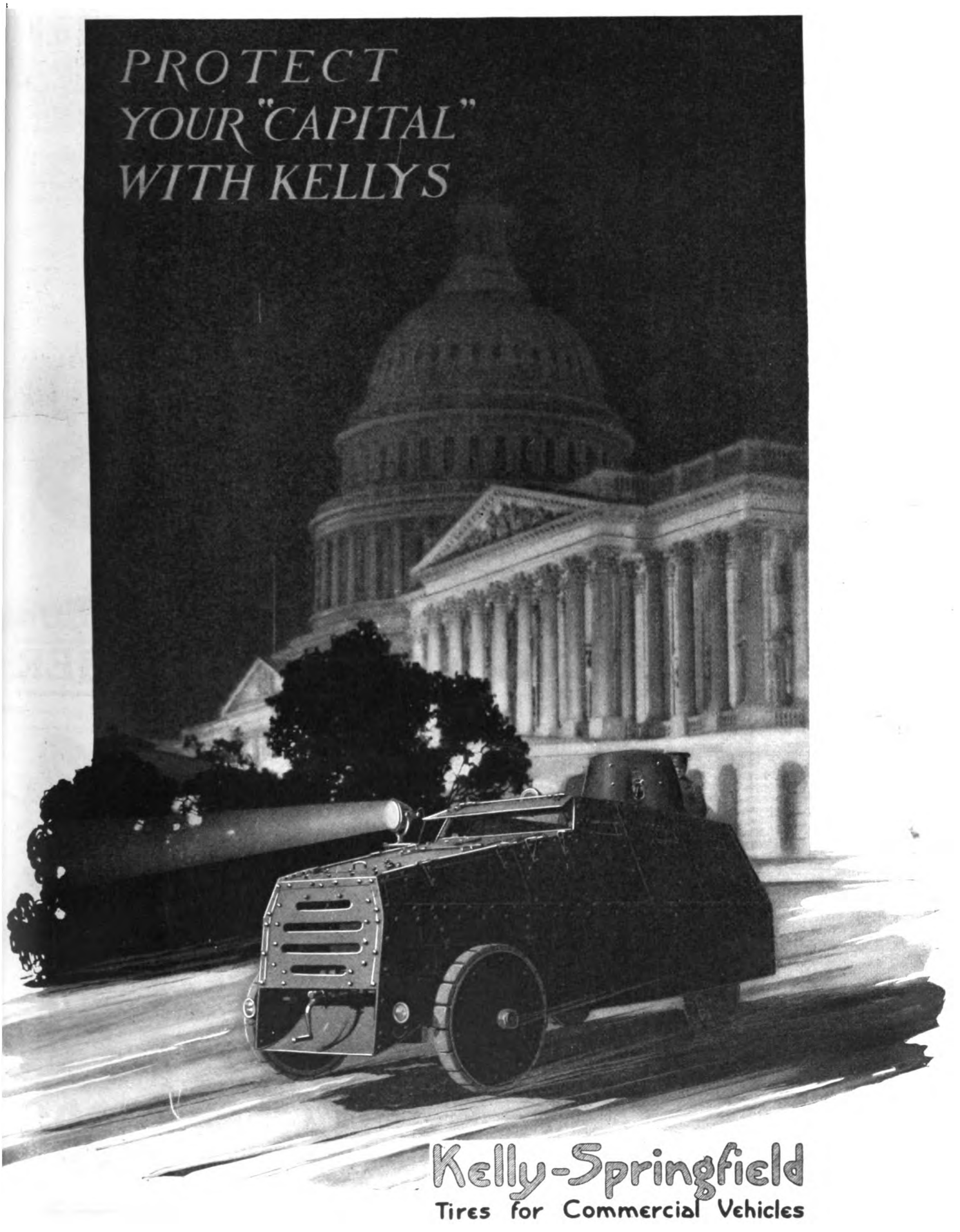
Outlying towns—distant shipping terminals—customers some miles away are brought right to your door. All this is business building.

Write for "FEDERAL Traffic News"—a business building publication. It covers very largely, actual haulage problems and their solution.

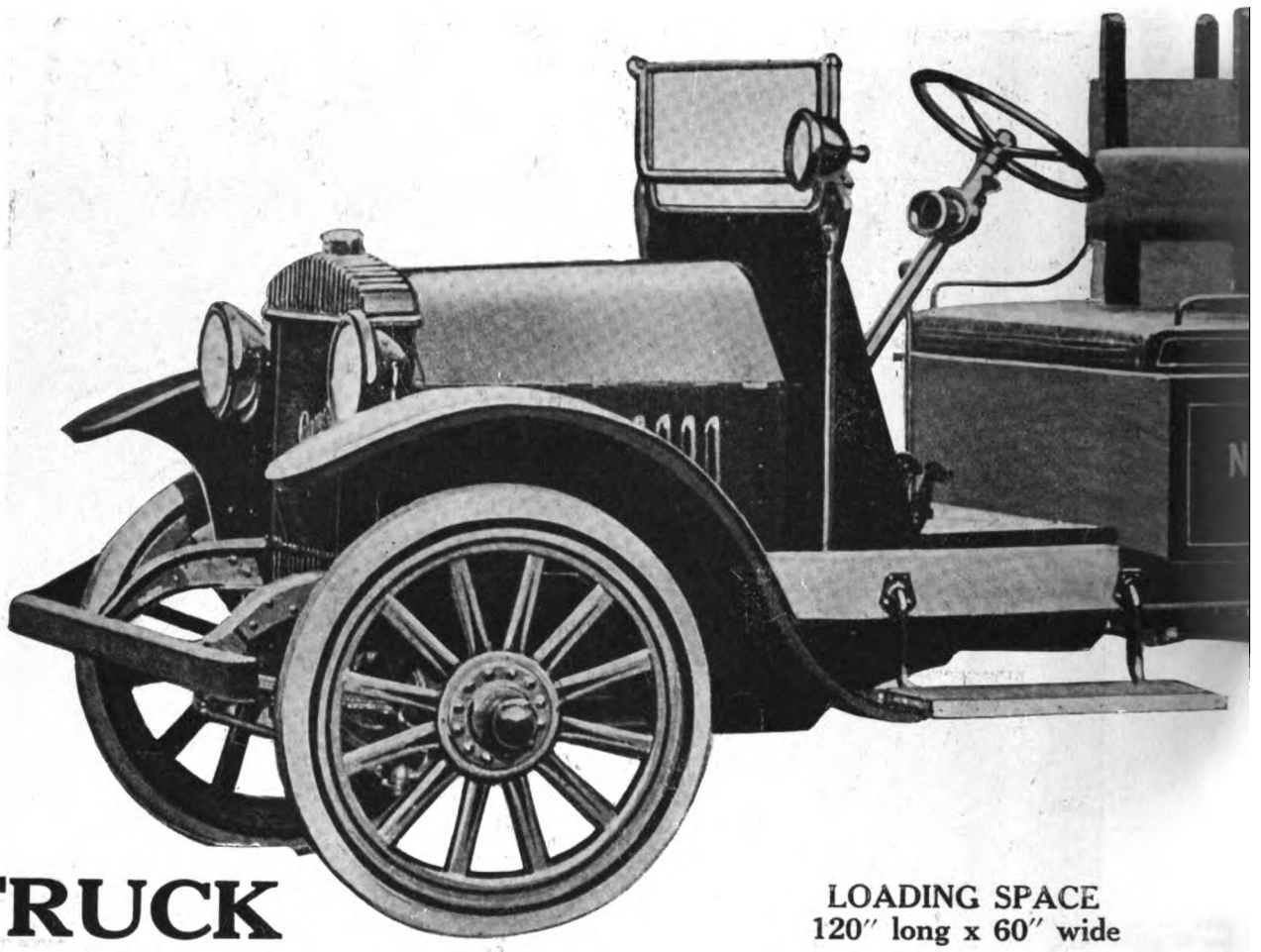
Federal Motor Truck Company, Detroit, Michigan

DERAL Advertisement for April is most unusual and thereby gets the attention of Millions of Readers who will see it.

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LOADING SPACE
120″ long x 60″ wide

A TRUCK THAT HAS NOW WHAT OTHER TRUCKS HOPE TO HAVE NEXT YEAR

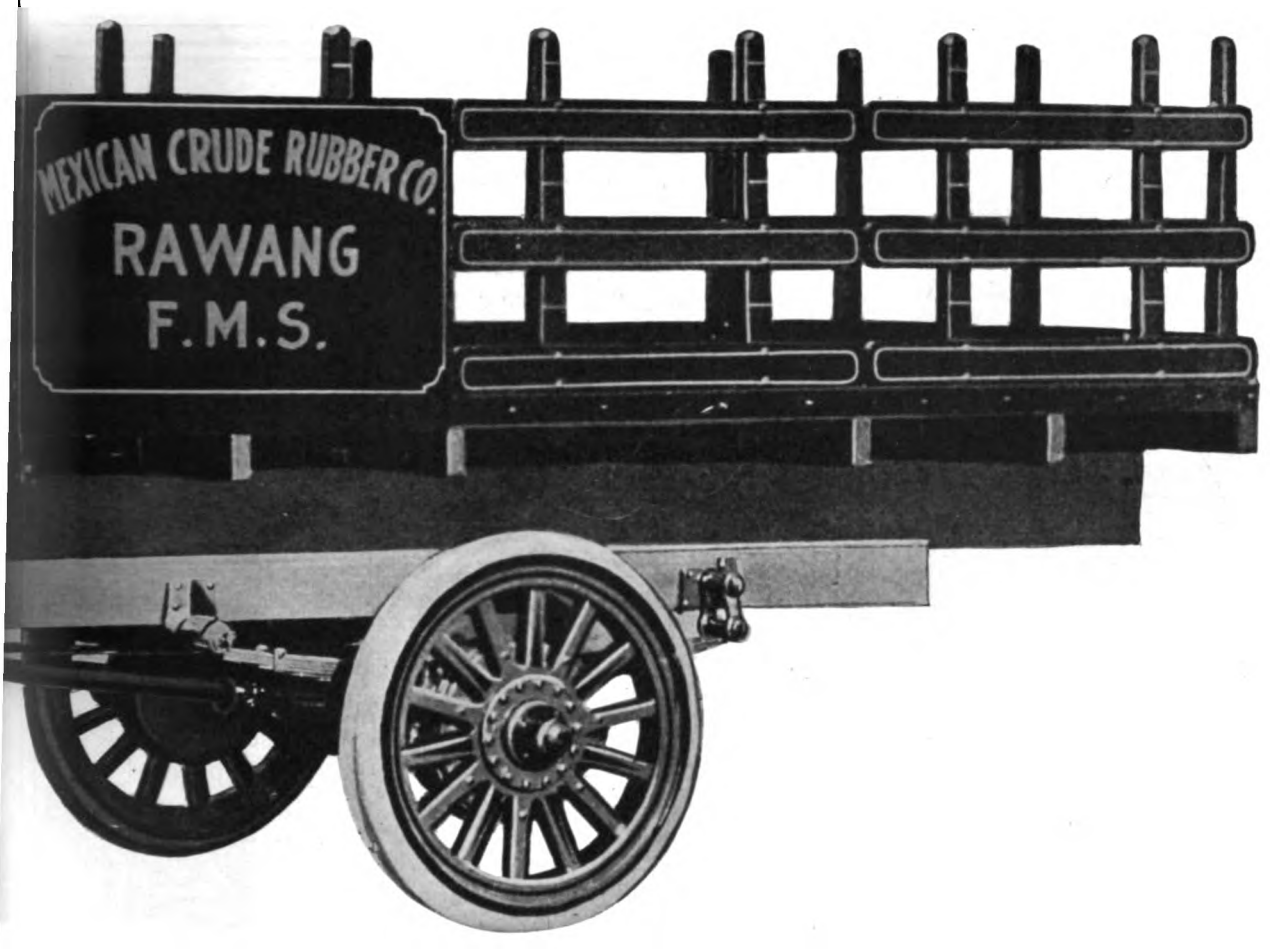
Commerce

ONE TON

New Model just added to Commerce Line, New York Type, stake job. Completely equipped.

$1390

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Fully Supplied with Up-to-the-Minute Equipment at No Extra Cost

It means a great deal to a truck buyer to be able to get his truck completely equipped, ready to go to work, with everything included in the purchase price.

And the Commerce is the only truck be can buy this way—with absolutely complete, up-to-the-minute equipment.

Everything known in the way of useful, time-saving, labor-saving, cost-cutting devices that have proved their efficiency and are really necessary to a properly equipped truck, is included in the Commerce Truck when you buy it.

A rugged, dependable, speedy truck, in all other respects equal to the very best of its class, the Commerce leads them all in point of equipment.

It is at this moment the logical truck for a dealer to sell—especially a wide-awake dealer, who realizes the value of giving his customers the very most for their money.

LOOK AT THESE!

Three Types of Bodies—A Windshield—Remy Starting and Lighting—A Spotlight—A Bumper (integral with frame)—Large Searchlights (with dimmers)—Stewart Vacuum System—Pierce Automatic Governor.

—AND THESE!

Continental Motor—Torbensen Internal Gear Rear Axle—Cast Tank Radiator with Removable Core—Truck Type Roller Bearing Front Axle—Unit Transmission, special truck type—Detroit Steel Products Company Springs.

These, together with special truck frame and fittings such as are usually found in a truck of 2 tons capacity, are the principal units that enter into the construction of the "Model ES" Commerce 1-ton Truck.

DEALERS: We advertise you in your home towns, and give you the shortest, fairest contract you could ask for. All over the country Commerce Dealers are doing a whale of a business—they have the jump on all competition. Write us to-day for terms.

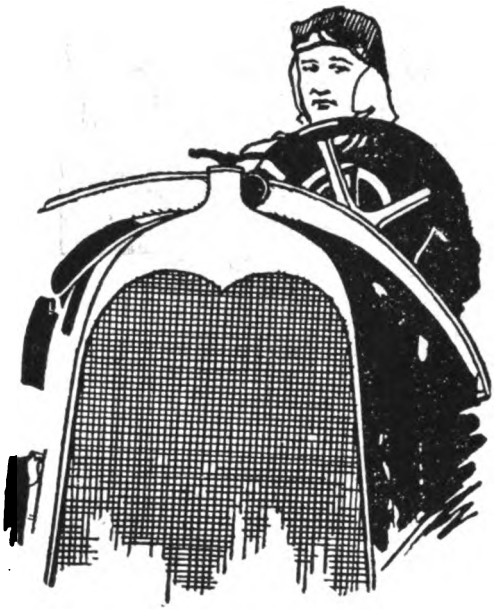
¾-Ton Model, $1075. Supplied with 3 types of bodies

Commerce Motor Car Company

DETROIT MICHIGAN

W. H. Brinkerhoff, Eastern District Manager, Belmont Avenue, Elmhurst, Long Island, N. Y.

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VICTORIES

Nothing demonstrates the position of FEDDERS Radiators in the American automobile game more clearly than the results of the races. Taking the racing results since mid-summer, we want to call your attention to the performance of cars equipped with

FEDDERS RADIATORS

Here is a résumé of the Fedders racing record for 1916.

Thirteen "firsts" out of twenty-seven officially sanctioned events. Forty-two "places" finished—and no Fedders-Equipt car was delayed at any time or forced to withdraw on account of cooling trouble.

1916 FEDDERS VICTORIES

CONEY ISLAND CUP RACE, 20 MILES, NEW YORK, MAY 13.

Car and Driver	Finish
Maxwell—Rickenbacher	4
Maxwell—Henderson	5

METROPOLITAN TROPHY RACE, 150 MILES, NEW YORK, MAY 13

Maxwell—Rickenbacher	1

INDIANAPOLIS INTERNATIONAL SWEEPSTAKES, 300 MILES, MAY 30

Maxwell—Henderson	6
Premier—Wilcox	7

DES MOINES 150-MILE RACE, JUNE 24

Maxwell—Henderson	2
Maxwell—Rickenbacher	3
Stutz—Cooper	5

SIOUX CITY 10-MILE RACE, JULY 8

Premier—Wilcox	4

SIOUX CITY 20-MILE RACE, JULY 8

Premier—Wilcox	4

SIOUX CITY 50-MILE RACE, JULY 8

Premier—Wilcox	1

OMAHA 50-MILE RACE, JULY 15

Maxwell—Rickenbacher	2
Maxwell—Henderson	3

OMAHA 150-MILE RACE, JULY 15

Maxwell—Henderson	4

TACOMA MONTAMARATHON, 300 MILES, AUG. 5

Maxwell—Rickenbacher	1
Maxwell—Henderson	5

CINCINNATI DERBY, 300 MILES, SEPT. 4

Peugeot—Aitken	1

INDIANAPOLIS 20-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Wilcox	2

INDIANAPOLIS 50-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Lewis	5

INDIANAPOLIS 100-MILE RACE, SEPT. 9

Peugeot—Aitken	1
Premier—Lewis	5
Maxwell—Henderson	7

ASTOR CUP RACE, 250 MILES, NEW YORK, SEPT. 30

Peugeot—Aitken	1
Maxwell—Rickenbacher	2

GRAND AMERICAN, 250 MILES, CHICAGO, OCT. 14

Peugeot—Resta	1
Peugeot—Aitken	2
Maxwell—Rickenbacher	3
Premier—Lewis	4
Maxwell—Henderson	5
Premier—Galvin	6

HARKNESS TROPHY RACE, 100 MILES, NEW YORK

Peugeot—Aitken	1
Premier—Galvin	2
Peugeot—Wilcox	3
Maxwell—Henderson	4

VANDERBILT CUP RACE, 294 MILES, SANTA MONICA, CAL., NOV. 16

Peugeot—Resta	1
Stutz—Cooper	2

GRAND PRIZE RACE, 403 MILES, SANTA MONICA, CAL., NOV. 18

Peugeot—Aitken-Wilcox	1
Stutz—Cooper	2

ASCOT DERBY, 150-MILES, LOS ANGELES, CAL., NOV. 30

Stutz—Cooper	2

UNIVERSAL TROPHY RACE, 112 MILES, UNIONTOWN, PA.

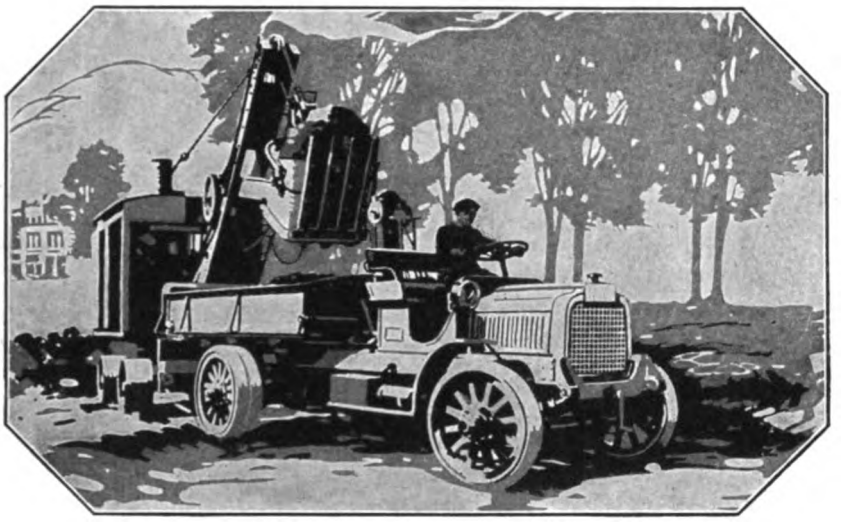
Premier—Lewis	2

This showing proves that the FEDDERS is still in its place as the foremost American Radiator

FEDDERS MANUFACTURING CO., Inc.

BUFFALO, N. Y.

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The Test of the Truck

To judge a truck wisely you should know what its present owners —men who have known and used it for years—think and say about it.

No mediocre truck can win and hold the respect of hundreds of men in widely different businesses.

But U. S. trucks for eight years have stood that test. Ask U. S. owners about the U. S. truck. They are its best friends—its most efficient salesmen.

More than half the men who have bought U. S. trucks during the past eight years have shown their high opinion of the truck by later buying additional U. S. trucks.

The Floating Power Plant—an exclusive U. S. feature—gives U. S. trucks exceptional ability on rought roads under hard conditions. Owners value it because it saves fuel, power, wear and adds thousands of miles to the life of the truck.

Let us put you in touch with U. S. owners.

Worm Drive 2½, 3½ and 5 ton. Chain Drive 3½ and 5 ton.

The United States Motor Truck Co.
CINCINNATI, OHIO

U S
MOTOR FLOATING POWER PLANT TRUCKS

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—"Added More Garfords"

The George Lill Coal Company of Chicago says, "Garfords we are using gave splendid service—so we added more."

Think that over—dealers!

If you can *qualify* for Garford representation you can *"Cash-in"* on these *repeat orders.*

If you handle the Garford you can offer your prospect the truck best adapted to *his particular* kind of hauling.

"The Garford is the one best adapted to our business," also says the George Lill Coal Company, and Garford owners all over the country agree.

So, you see, it's a question of selling the *right truck.*

The Garford line is right—and it's complete.

Each Garford, in its tonnage class, is the best possible vehicle we are able to build.

Write for more complete data.

Address Dept. 103.

Garford MOTOR TRUCKS

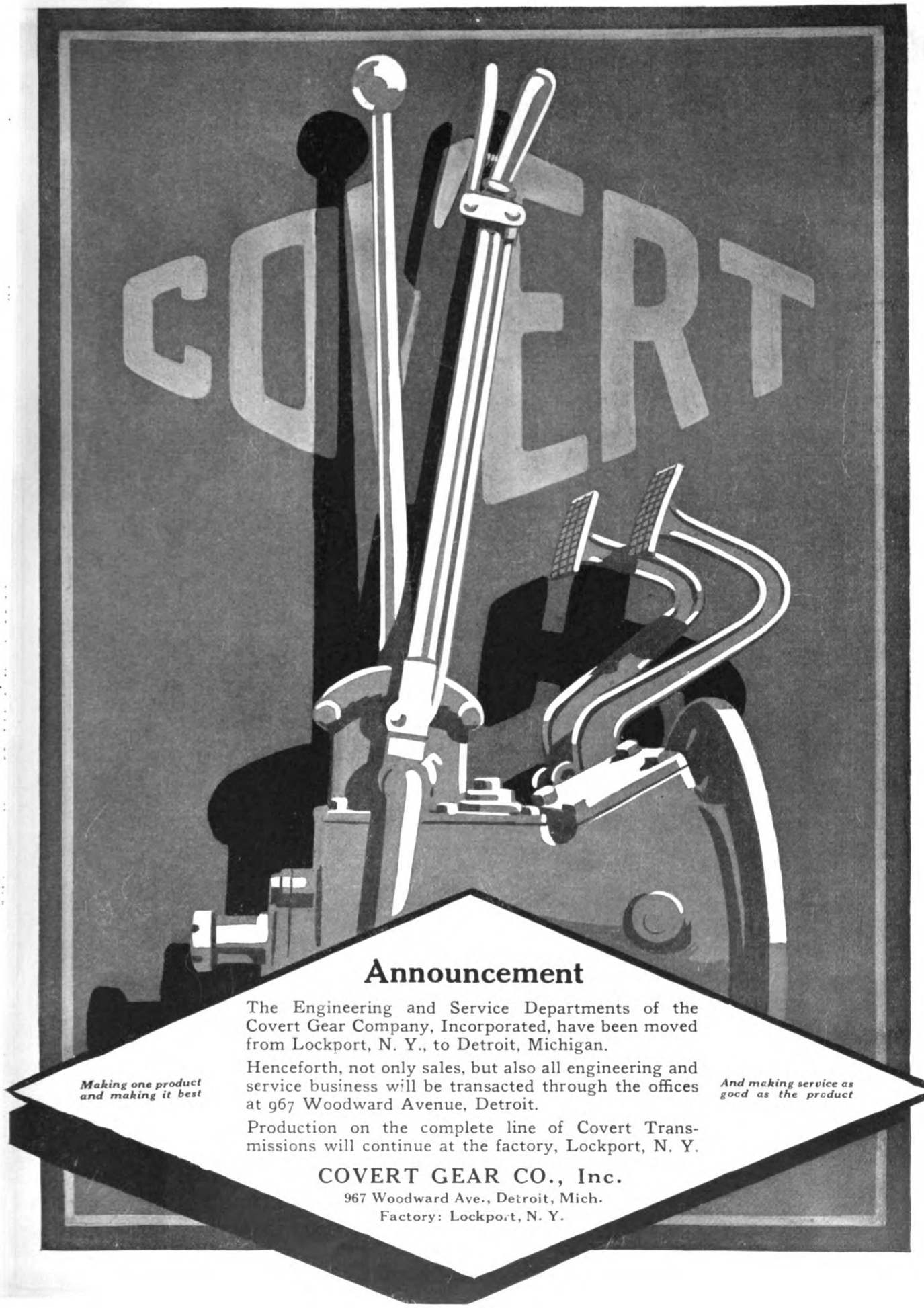
The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity
4½, 7 and 10 ton Tractors

THE GARFORD ROAD BUILDER

Distributors and Service Stations in all Large Cities

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Announcement

The Engineering and Service Departments of the Covert Gear Company, Incorporated, have been moved from Lockport, N. Y., to Detroit, Michigan.

Henceforth, not only sales, but also all engineering and service business will be transacted through the offices at 967 Woodward Avenue, Detroit.

Production on the complete line of Covert Transmissions will continue at the factory, Lockport, N. Y.

Making one product and making it best

And making service as good as the product

COVERT GEAR CO., Inc.
967 Woodward Ave., Detroit, Mich.
Factory: Lockport, N. Y.

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive $1095 | **Two-Ton Worm Drive $2200** | **Three-and-One-Half-Ton Worm Drive $3100**

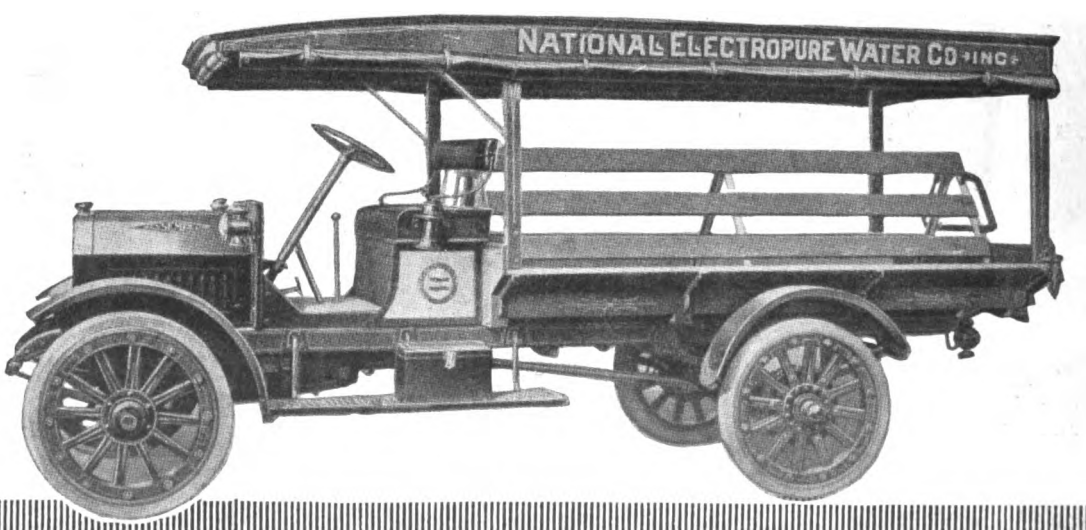
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

Bessemer Motor Truck Company **Grove City, Pa.**

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State



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BOCK

Everything Rolls

End friction—the source of constant wear and tear in most bearings—*is entirely eliminated in the Bock.*

The bearing end of each Bock roller is a section of a sphere—and *rolls.*

And in addition to this exclusive and invaluable feature the Bock gives you all the load carrying capacity of *any* roller bearing.

It combines the best features of *both* the roller and the ball bearing.

Everything rolls in the Bock.

And automobile engineers are practically unanimous in their approval of it.

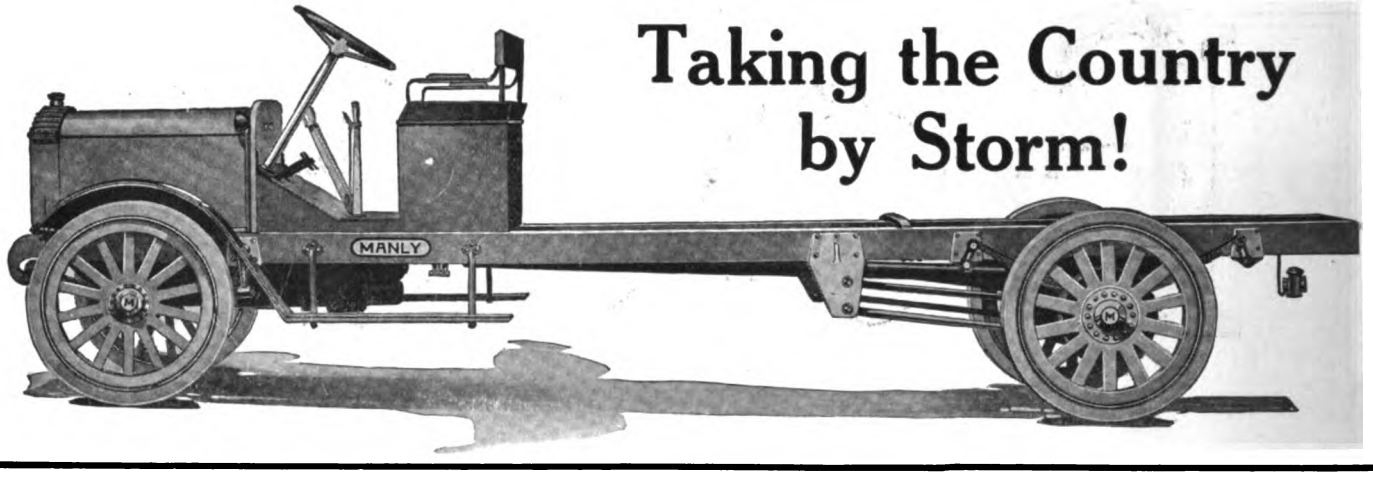
So great is the demand for Bock Bearings that we have had to triple our factory facilities to handle the tremendous increase in business.

Ball Ends

The only roller bearing with frictionless rolling end contact

The Bock Bearing Company - - - - Toledo, Ohio

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MANLY

1½-Ton 2½-Ton TRUCKS

Already our production facilities are being pushed to the limit, to supply the demand for MANLY Trucks.

Our present organization of dealers and distributors is by no means complete.

We are choosing our representatives with discrimination and care.

MANLY Trucks deserve a field organization of exceptional ability, for MANLY Trucks are exceptional. We are painstakingly getting such an organization together.

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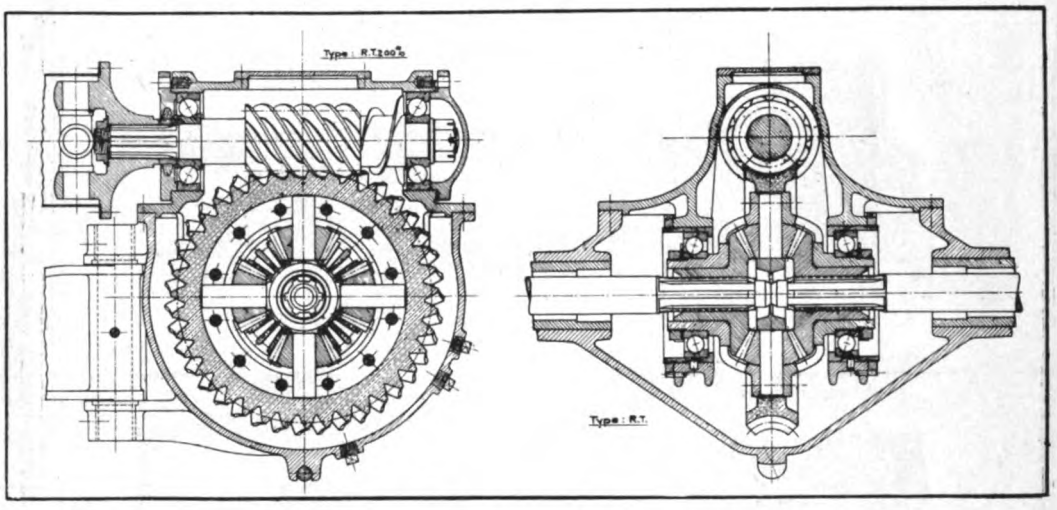
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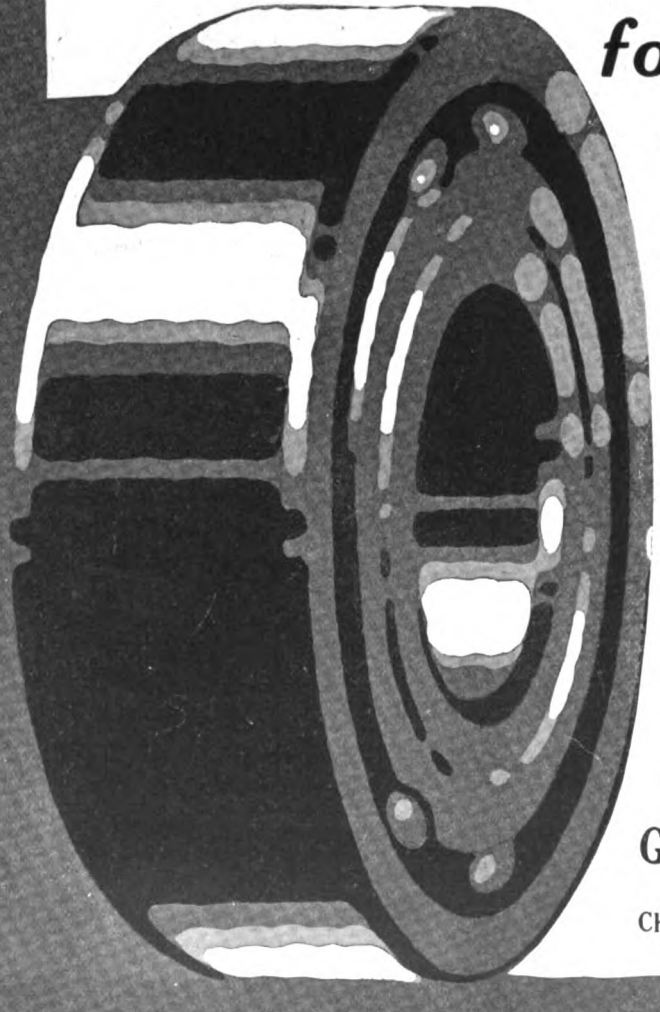
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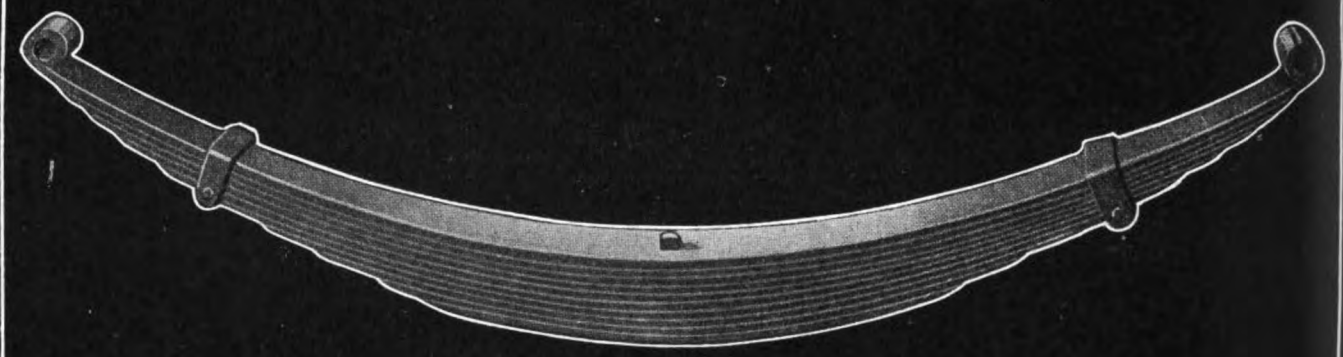
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The COMMERCIAL VEHICLE
Read by Business Men

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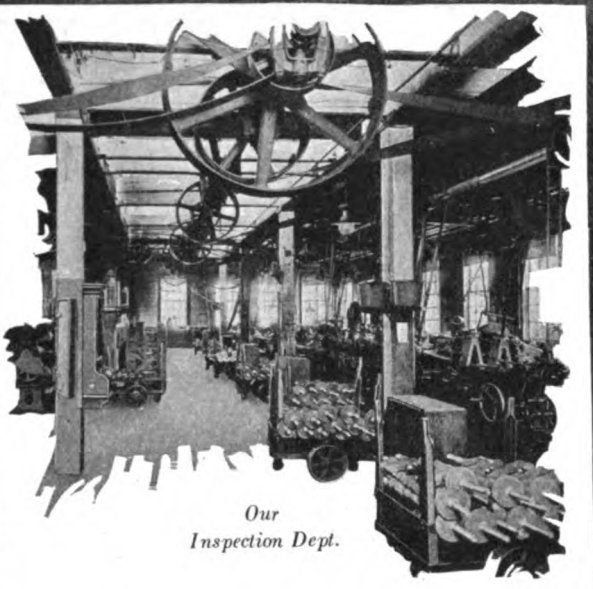
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FROM

THE PRESIDENT'S PROCLAMATION
April 15, 1917

"TO THE men who run the railways of the country, whether they be managers or operative employes, let me say that the railways are the arteries of the nation's life, and that upon them rests the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind, no inefficiency or slackened power.

"To the merchant let me suggest the motto, 'Small profits and quick service'; and to the shipbuilder the thought that the life of the war depends upon him. The food and the war supplies must be carried across the seas no matter how many ships are sent to the bottom. The places of those that go down must be supplied and supplied at once.

"To the miner let me say that he stands where the farmer does. The work of the world waits on him. If he slackens or fails, armies and statesmen are helpless. He also is enlisted in the great service army.

"The manufacturer does not need to be told, I hope, that the nation looks to him to speed and perfect every process; and I want only to remind his employes that their service is absolutely indispensable and is counted on by every man who loves the country and its liberties.

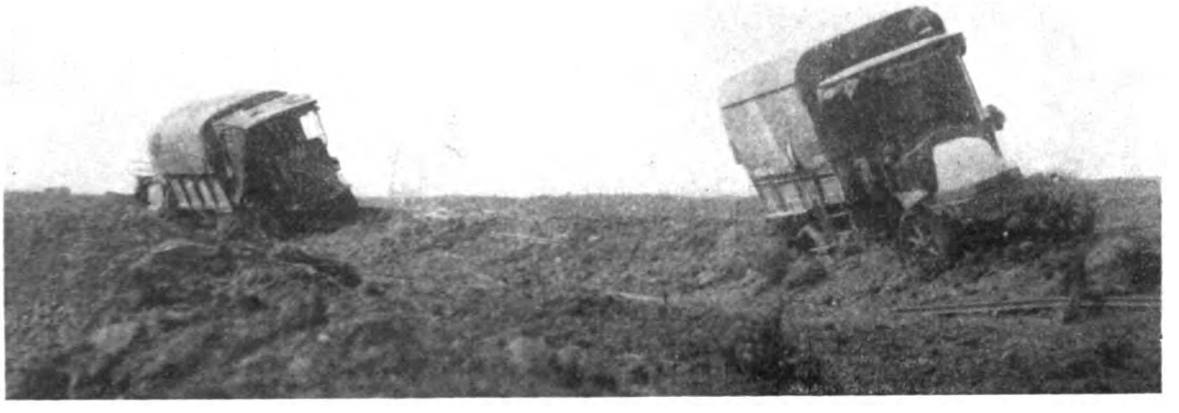
"It is evident to every thinking man that our industry on the farms, in the shipyards, in the mines, in the factories, must be made more prolific and more efficient than ever, and that they must be more economically managed and better adapted to the particular requirements of our task than they have been; and what I want to say is that the men and the women who devote their thought and their energy to these things will be serving the country and conducting the fight for peace and freedom just as truly and just as effectively as the men on the battlefield or in the trenches.

"This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful, provident use and expenditures as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring."

In accordance with the suggestion of the President that his appeal receive widespread publicity, these extracts from his Proclamation occupy the advertising space scheduled for this month by The Autocar Company, of Ardmore, Pennsylvania.

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI May 1, 1917 No. 7



This reminds us of Mexico, yet it is but one example of the strenuous war conditions met with by trucks on portions of the Carso front in Italy

Italy's War Truck Experience A Lesson for American Army

Industry Undisturbed When War Broke Out—Italian Trucks Speedier Than Ours—Other Requirements

By W. F. Bradley

WAR is the supreme test of motor truck design and construction. The stunt performances which are carried out in peace time by makers are equalled in every-day service by trucks just behind the front line trenches. There is this essential difference, that when a factory decides on some severe test, a transcontinental trip, for instance, it starts with a well-prepared machine in the hands of its most skilled driver and mechanic. Under active war conditions such performances have to be equalled with drivers of very ordinary ability and without any mechanical expert in the near background. A defect which can be tolerated in private service, because it is nothing more than an inconvenience, and can be prepared for and met under the most advantageous conditions, becomes a curse under active war work.

It is the intention in this article to point out some of the defects and weaknesses of Italian trucks which have revealed themselves under active service. By this is not meant convoy work 15 or 20 miles behind the lines, where roads are good, shells are unknown, and, with proper organization, conditions need not be very much more severe than in private service. The experience covers vehicles which are constantly under fire. There are thousands of such vehicles on the various fronts of Europe. The expression "under fire" does not imply stretches

Italian War Truck Details and Defects

1—Five-ton trucks too heavy.
2—Trailers not used because of grades which reduce tractor speeds.
3—Inclosed chain drive predominates on Italy's war trucks.
4—Metal wheels used on 90 per cent of trucks.
5—One and one-half-ton trucks have small motors of 270 cu. in. piston displacement and travel at 20 m.p.h.
6—Electric starting and lighting unnecessary.
7—Pressure fuel feed used, but is unsatisfactory.
8—Clean-cut engine design essential.
9—Engine oil indicator unnecessary, but oil filter is essential.
10—Thermo-syphon cooling is not satisfactory.
11—Positively driven radiator fans needed.
12—Brake adjustments should be very accessible.

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CHARACTERISTIC SCENE ON THE ITALIAN BATTLEFRONT

Italian motor trucks bringing up reserve troops for an attack against the Austrians in one of the mountainous districts, a work in which trucks excel because of their large carrying capacity and the comparatively high rate of speed at which they travel. Above the men are seen deploying from the transport trucks and forming units preparatory to launching an attack

of road on which shells are falling as thick as hailstones in a storm, nor has it very much in common with the illustrations prepared by artists thousands of miles from the front. Flying shell splinters are only seen by artists of imagination. But they are felt and heard daily—hourly—by every truck driver attached to the front line forces. Working under fire does not mean that a car is disabled every time a shell bursts. Only mules and horses are irretrievably lost by splinters of shrapnel. A truck may be within effective distance of hundreds of exploding shells and, unless some essential organ happens to be hit, emerges none the worse for it.

The term does imply running over roads which can never be repaired, if we refuse to recognize the dumping of earth and bricks as repair work; it means going over those roads at a fast pace, for it is beyond human nature to keep the foot off the accelerator pedal when the whistle of incoming shells is heard; it means driving at night in such black darkness that even the glow of a lighted cigarette in the mouth of a mechanic on an approaching vehicle is helpful and welcome; it means garaging the trucks in some wrecked courtyard, probably inches deep in mud; it means no facilities for washing other than the river or a stream, when business is slack; it means doing all repairwork in the open-air, with shells passing overhead in both directions; it means satisfaction with a very meagre set of tools.

Italy is the only allied nation in the war self-sufficing in the matter of war trucks. Unlike England, France, Belgium, Russia and Portugal, the Italian Government has not bought a single American or other foreign truck for war purposes.

There are some American vehicles serving with the British Red Cross units in Italy; also there are a few French, English and German passenger cars being used as staff cars or in service with the Italian Red Cross. These, however, were already in the country and have been requisitioned since war broke out. Not only can the Italian industry supply all its army's needs, but it has a very important surplus for the Allies.

Industry Not Hindered

This state of affairs is not primarily due to the fact that Italy has an important motor vehicle industry, but has been brought about by a plan which left the industry undisturbed when war broke out, a most important plan, and one of which the United States should now take cognizance. It is quite likely that France could have been as independent had the Allies premeditated this war as much as Germany would like the world to believe. But Italy was in the fortunate position of coming into the war at her own time and having the experience of her Allies as a guide. Thus she speeded up her truck factories and left them at their ordinary work, while all her neighbors had to go through a revolution involving the stripping of the factories to meet the army call for soldiers and a reorganization of the plant to meet the new conditions. The United States, in a similar position, should take advantage of that experience now.

Italy's trucks are made by but nine concerns, all of which are located in two towns, Turin and Milan. Most 3½-ton trucks are made by Fiat, followed by Scat, Spa and Bianchi. Some of the others, of course, produce trucks of this carrying capacity, but they are almost negligible quantities. Trucks of 1½-ton carrying capacity are largely specialized in by Fiat and Lancia.

The Italian industry is such a close corporation that there are not the differences in design to be found in America, England or France. In the manufacturing centers everybody knows what his competitor is doing, with the result that it is impossible for anybody to get away on a new and successful idea without the rest following.

The biggest truck employed on the Italian front carries a live load of 3½ tons. There were 5-tonners made before the war, but none are employed by the army. Experience has shown that the 5-tonner is too heavy for work on the Italian front; this also confirms the ex-

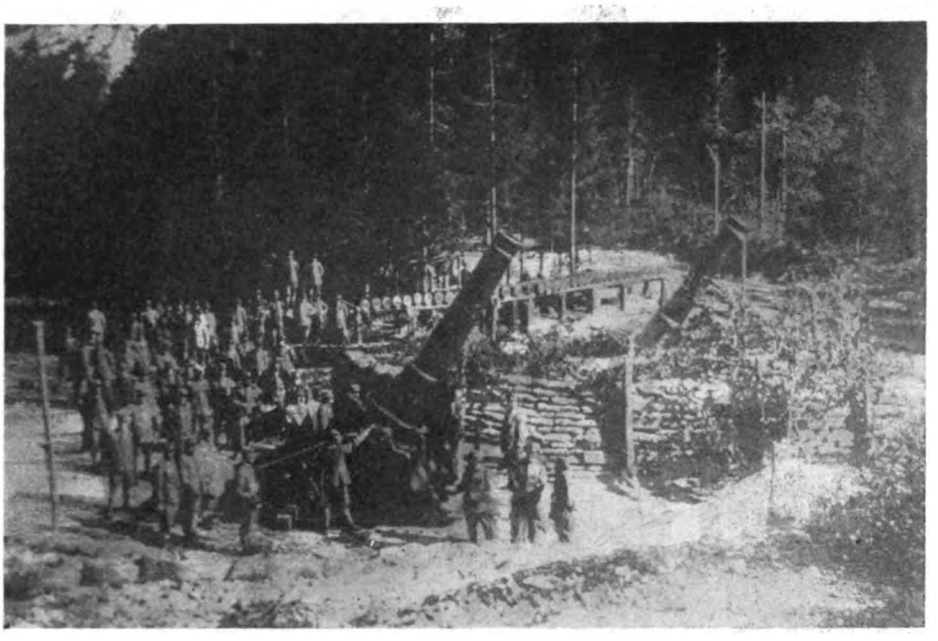
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perience on most portions of the French front.

There is an almost complete absence of trailers, contrary to the practice in France. The explanation is that at practically every point of the line the Italian army is in the enemy's territory and working in hilly country where roads are good so far as surface is concerned, but narrow and winding. The French, on the other hand, are well inside their own borders and have a perfect set of highways.

There are certain features common to all Italian army trucks. They are motor under a hood, platform body with removable sides, four-speed gearbox, and either inclosed chain or internal-gear drive, the former greatly predominating. Cast steel wheels are in a huge majority, and practically all trucks have rubber tires. There are a few trucks running with steel tires, but they appear to be old models in service long before war was declared. The use of metal wheels is very pronounced. If pure passenger car types are put aside, not more than 10 per cent of Italian trucks are running on wood wheels. The 3½- and 2½-ton trucks have cast-steel wheels, while the 1½- and 1-ton models are fitted with steel disk wheels and pneumatic tires, single in front, twin at the rear.

The piston displacement of the 3½-ton truck varies from 270 to 400 cu. in., the average being about 320 cu. in. In every case they are L-head castings with partial or complete force-feed lubrication, pump cooling, magneto ignition, governor on the throttle, and integral intake manifolds. Gasoline is always under pressure at the rear, neither gravity nor vacuum being employed on trucks. Metal dashes are general, usually being a steel stamping, but in some cases an aluminum casting. There is some variety in clutches, but all are of the disk type, the leather cone being unknown. Final drive by side chains in a metal housing also forming radius rods is in an immense majority, for it is used exclusively by Fiat and Spa. An alternative system is the internal-gear drive employed by Scat. A considerable use is being made of cast iron for the upper half of the crankcase, the casting being sandblasted and finished to give the appearance of aluminum. Base chambers are always cast aluminum, as are timing-gear and governor housings and fans.



A battery of 305 mm. or 12-in. guns going into action. These guns are served entirely by motor trucks, much of the work going on in the daylight. Usually guns of this size are 6 miles behind the enemy's front and unless the country is very much exposed the convoys run right up to them

Have Same General Features

The 2½-ton models have the same general features as the 3½-ton truck, the engine varying from 210 to 270 cu. in., the motors having four cylinders block cast. The four-cylinder motor predominates in the Italian army, and with the exception of some of the special tractors cylinders are block castings. One of the important differences of the 2½-ton type is the use of single, solid tires, generally of 140-mm. section, compared with twin solids of 120-mm. section on the larger type. A 2½-ton load can be carried satisfactorily on a single 140-mm. tire, thus avoiding one objection to twins, namely, the picking up of stones, which become wedged between the two and do a considerable amount of damage to the rubber. This is a defect which applies to twin pneumatics with even greater force.

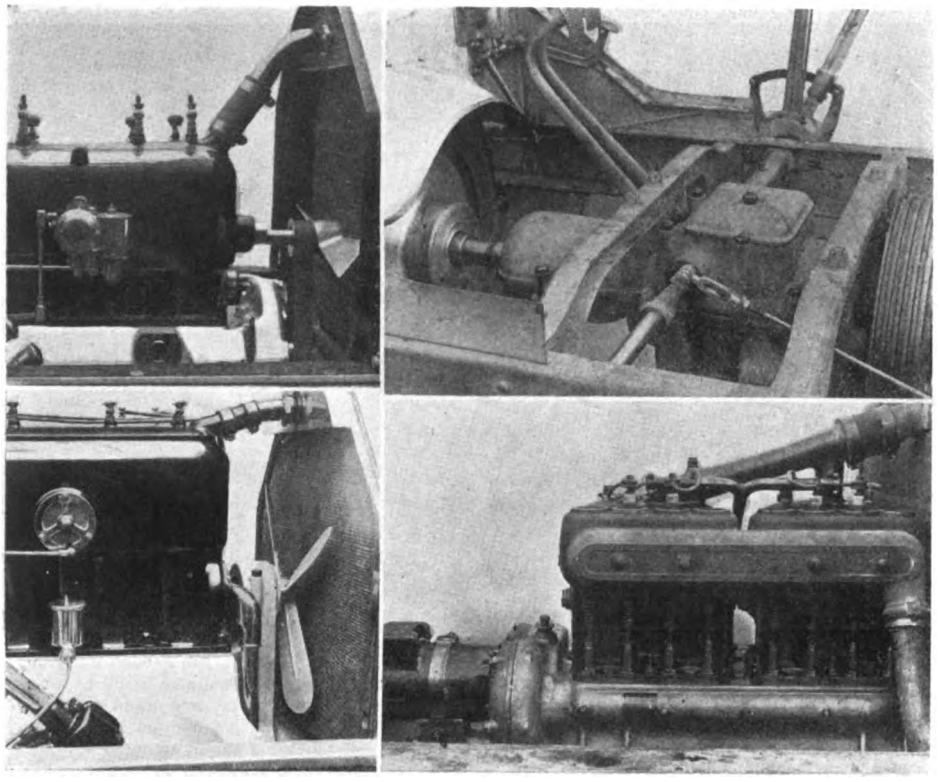
The third type of truck is the 1½-ton model, which differs in every respect from the larger vehicles. The Italian army makes use of an immense number of 1½-ton trucks, having a four-cylinder motor of 270 cu. in., fitted with twin pneumatic tires, officially running at 20, but generally running as fast as 30 m.p.h. These trucks do entirely different work from that given to the 2½- and 3½-ton vehicles. They operate in small convoys, taking up small ammunition and food, and are also used for the quick removal of troops from one point to another. A body very similar to that of the larger trucks is used, and as it is light it enables a load of twelve to fifteen men to be carried.

It is worth while comparing the specifications of the 1½-ton American war truck, published on pages 34 to 44 of this issue, with those of the Italian vehicle. In the first place there seems to be no use for a 15-m.p.h. vehicle carrying such a small load as 1½ tons. Even in the mountain districts and on the bad roads close to the lines there appeared to be no necessity for a slow-speed vehicle carrying less than 2½ tons. Below this was required a vehicle for rapid transport, and a 1½-ton about filled the



Where a motor tractor would have replaced forty to fifty men and performed the same work in much less time—Italian troops acting as draft animals in hauling a large siege gun into position

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GOOD AND BAD DETAILS OF SOME OF THE ITALIAN WAR TRUCKS

In the upper left, a small radiator fan which does not sweep a sufficient area of the radiator to provide the most efficient cooling

At the lower left, a clean design of engine as used on the Spa truck. Note that water pump is in the cylinder casting and that the fan is positively driven off the pump shaft, thus eliminating troubles experienced with slipping fan belts

In the upper right, a rear wheel brake adjustment correctly placed under the floor boards instead of at the rear, where caked mud in the threads renders adjustment very difficult and often prevents it

In the lower right, a good example of valve steam accessibility, but with a sharp bend in the exhaust manifold because of radiator on the dash

bill. One-ton models were tried and not found satisfactory. The American specification calls for 312 cu. in. as a *minimum;* in Italy it is a *maximum.* The two types are similar as regards number of cylinders, valve location, main bearings and oiling. The use of battery ignition for starting does not appear necessary. There is not a starting battery in the Italian army, and hundreds of vehicles in the French army have had their batteries removed, so as to rely entirely on the magneto. The specification is in agreement with Italian practice as regards pump water circulation and drain off, but Italian experience has showed that a flat belt gave just as good service as the V type. Naturally, easy provision for tensioning has to be provided. There is agreement on four speeds and reverse, but not on double universal joints for propeller shaft. The Italian practice is a single universal. Hotchkiss drive is not used in Italy. Rear axle is bevel or spiral bevel, and not worm or double reduction. Steering knuckle tie rods are located behind the axle, which is undoubtedly the correct position. It has already been said that the Italian conception comprises pneumatic instead of solid tires. Another distinctive feature is the use of steel disk wheels of detachable type. These are ideal for war purposes; after experience of all kinds under conditions right at the front, the writer unqualifiedly favors the steel disk.

Lighting Practice Not Like U. S.

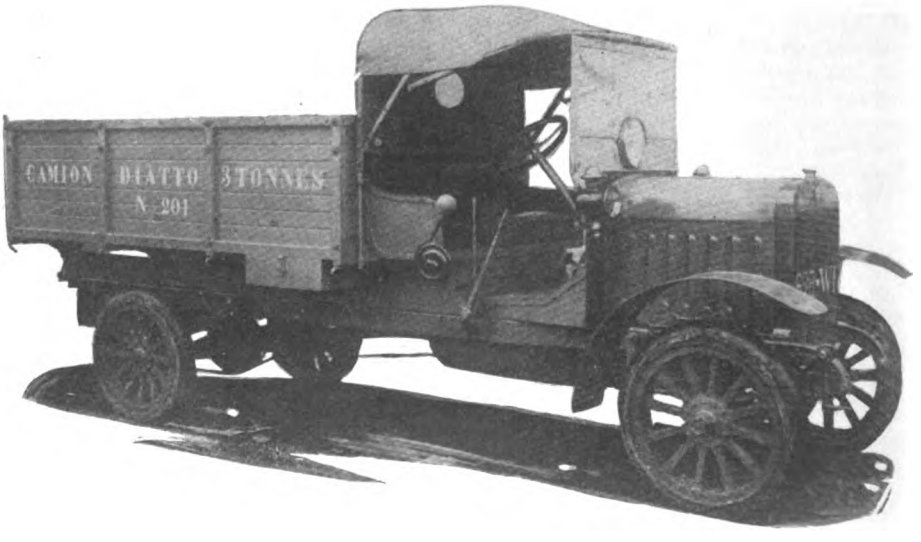
The electric lighting specification of the American truck is not in accordance with Italian practice; nevertheless it is good. Practical experience shows, however, that a tail light is perfectly useless. The Italians adopt pressure feed gasoline, as recommended in the American specifications. An auxiliary hand pump on the dash is fitted and is really necessary, for connections are always liable to leak, and the pressure system as a whole is very unsatisfactory. Italian cars do not carry one-tenth of the spares mentioned in the American specification, and it is doubtful if any army vehicle anywhere in Europe has such a wealth of parts. Under war conditions if so many parts were given out they would either be lost or stolen within a few days.

No Steam Vehicles Used

Except on rails, no steam is made use of in the transport system of the Italian army. Four-wheel-driven tractors are also absent. Very heavy haulage, particularly the removal of big guns, is done by three makes of gasoline tractors which were in existence long before the outbreak of war. They are the Fiat chain-driven tractor with a four-cylinder 5.1 by 7.8-in. engine, equipped with solid rubber tires on the front wheels and steel at the rear; L'Aratrice, a four-cylinder low-built agricultural tractor developed for military work; and the Soler, a single cylinder double-piston tractor with six speeds and final drive by side chains. The Fiat and the Soler carry some load on their platforms; L'Aratrice hauls entirely.

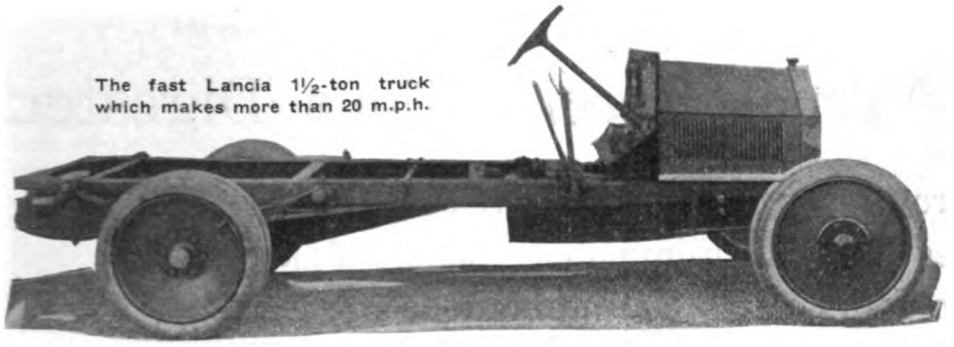
In the early days of the war the statement that ammunition was taken direct to the batteries by motor trucks caused a certain amount of surprise and was regarded as a wonderful exploit even by members of the industry. On the Italian front it is the general practice to supply all the batteries in this way. Indeed, the truck service does not stop at the line of batteries, but goes considerably ahead of it; motor ambulances, for instance, working within ½ mile of the trenches.

The big guns, by which is meant calibers of 8 in. and upwards, all have their ammunition brought up direct by truck, much of the work going on in daylight. Whether a daylight service is possible or not will naturally depend on



A Diatto 3-ton truck characterized by the position of the headlight in the windshield. Two defects are shown, the absence of steel wheels, which is an exception on Italian war trucks, and the absence of a suitable radiator guard

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The fast Lancia 1½-ton truck which makes more than 20 m.p.h.

local conditions. Usually guns of this size are 6 miles behind the enemy's front positions, and unless the country is very much exposed convoys can go right up to the batteries without any danger of being seen. The only danger lies from aeroplanes. It must not be supposed that ammunition is dumped down at the base of the gun. All around the battery substantial dug-outs are constructed, and in each one of these a certain number of shells will be stored. Very often rails are laid from the dug-out to the gun and the shells pushed up as required on a small bogey.

Motor Trucks Supply Ammunition

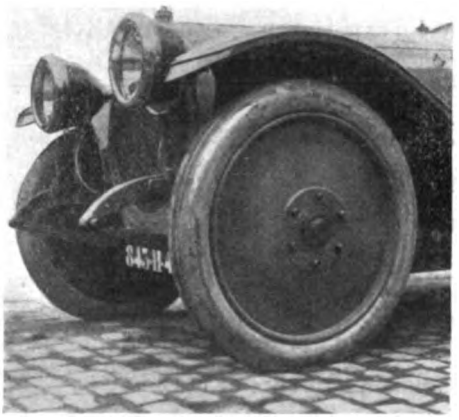
The smaller the gun the nearer it is to the trenches, the 75-mm. field pieces being only a short distance behind the infantry. Even these guns, however, rely almost exclusively on motor trucks for their supply of ammunition, but convoys do not usually move up until night, and then in complete darkness, the work of driving, unloading and storing the shells being done without so much as the light of a match being revealed. Here again the ammunition is stored in caves so as to hide it from the enemy and diminish the risk from explosion if the opposing batteries open fire.

Trench mortars, aerial torpedoes, rifle ammunition and food for the troops in the trenches are all carried up by a combination system of truck and horse or mule traffic. The bulk of this ammunition will be taken to stores as far forward as possible, and in nearly every case ahead of the artillery, from which it will be moved up under darkness, by means of pack mules or light carts. The final distribution to the men in the trenches cannot be economically undertaken by truck, for not only are there no roads, but the country may be under rifle fire, and supplies should be distributed as much as possible to avoid loss.

Mechanical Efficiency High

On the Italian front the conditions are unusually strenuous, but the variety of vehicles is not great and their mechanical efficiency is too high for the man who is principally interested in defects. The vehicles comprise all the Italian makes, also Buicks, G. M. C.'s, Overlands and Fords, and a sprinkling of English, French and Belgian passenger car chassis.

Clean cut motor design is very much more important to the driver in the war zone than would appear at first sight. The conventional L head type with enclosed valves, bolted-on ribbed exhaust manifold, a straight length, integrally-cast intake manifold, with carbureter bolted direct to the cylinder casting, magneto and pump driven from a cross-



The type of steel disk wheel with which almost 90 per cent of the Italian war trucks are equipped and which has given very satisfactory service

shaft in front of the motor, and a belt-driven fan constitute the cleanest motor, the most accessible and the easiest to maintain. A motor of this type, which can be cleaned in 5 minutes with the aid of a kerosene brush and a rag, is much more likely to be kept in proper condition by the average driver than an engine of complicated and inaccessible design.

War experience shows that an oil indicator is unnecessary. The glass sight feed on some trucks, for instance, was absolutely useless, for after a few days the glass was so dirty that the flow could not be observed; in any case it was not visible from the driver's seat, and it was very liable to be broken by an accidental kick with the foot. A few firms have realized this, the French Darracq, some Delages and Panhards, for instance, now being without indicators.

It is an easier matter to get drivers to verify the oil level than to keep an eye on the oil indicator; certainly the man who would not trouble to verify his oil would not watch a dashboard indicator. Even on war service cars are not run continuously for such a length of time that the oil supply is liable to become exhausted. On some of the Italian cars the oil pressure indicator was a danger, for owing to partial choking of the filter on the oil line a high pressure might be recorded while very little oil was getting through to the bearings.

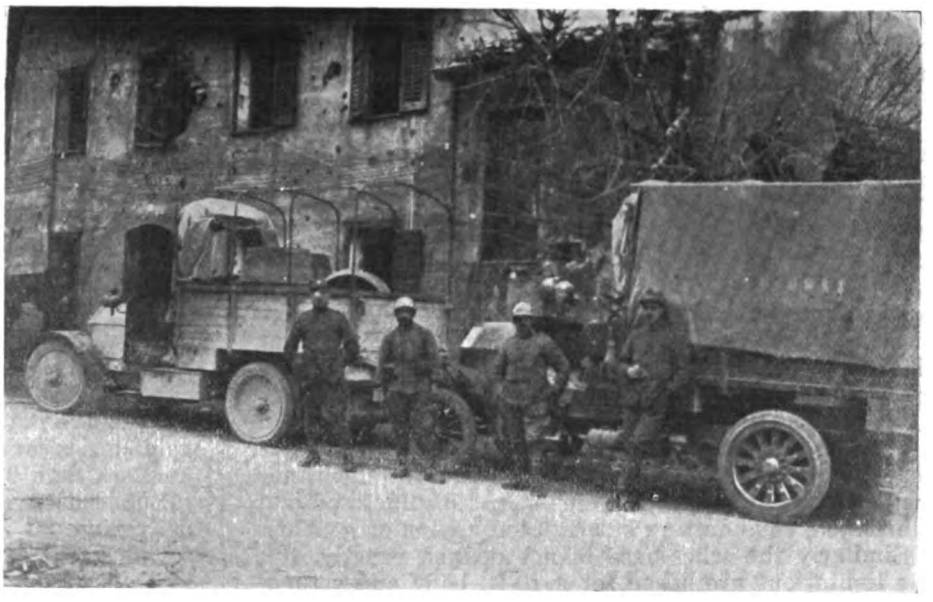
Oil Filter a Necessity

A filter on the oil line is very essential for war work, owing to the poor quality of oil usually supplied and the amount of foreign matter liable to get into it accidentally.

Thermo-syphon cooling has not proved a success on war service. All Fords going into service in Italy have a special big-capacity V radiator, yet it was impossible to take these cars over many of the lower passes in summer time without the water boiling away.

Cellular radiators are entirely out of favor on the Italian front, the great majority of trucks having the finned-tube type.

Both V-section and flat fan belts were used, but neither showed any great preference. The uniting of the fan blade tips by a ring was sometimes disadvantageous, for it operated to prevent the belt being put on after it was sewn or riveted.



Two Fiat trucks, a 2½-tonner at the left and a 1½-ton model at the right, awaiting orders to move forward to the front line positions

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New U. S. Army Truck Specifications Digested

Are Great Improvement Over Previous Specifications—Petty Detail Requirements Eliminated—Enable Makers to Change from Commercial to Military Models Rapidly

SPECIFICATIONS for 1½ and 3-ton motor trucks for the use of the army were issued April 12 and are reprinted in full on pages 34 to 44. They are a great improvement over those given out last summer and all concerned in their preparation deserve the heartiest congratulations for completing a very fine job. Full account has been given to experience on the Mexican border, full account to what our manufacturers know from experience of the trucks they have sent to Europe. No available information seems to have been neglected, and while the present specification may not be ideal there can be no question that it is a thoroughly good one.

As a whole the specifications are very free from petty detail, in which they are a great improvement upon those issued last summer. They provide a truck which is entirely commercial except in a very few particulars, and those are such that the alterations would be simple. Take the large radiator for example. This would not be good for conventional service, but it is easy to design the truck to take either the military radiator or a smaller one. So with other parts, that which is uncommercial can be provided for, even if not supplied to the commercial customer.

Following some such procedure as this would permit a truck maker to change over from his standard to his military type in days instead of months. Meanwhile the specifications are drawn so widely that twenty trucks could be built to fill them and yet not be by any means the same truck. Maximums and minimums are used at many places, giving plenty of room in between. The twelve features in the box on this page are the main essentials and it is made fairly clear that departures from them will not be permitted. In most other respects, however, the specifications are quite elastic enough. For example, the form of final drive may be chain, worm, internal gear or double reduction gear; the only requisites are the clearance of 9¾ in. and that all parts must be fully inclosed and lubricated, thus cutting out exposed chains or gearing.

Similarly the wheelbase is not defined exactly, but the limitations are space for a 10-ft. body and a turning circle of 55 ft. Wheelbase should be not less than 124 nor more than 150 in.

Digest of Important Essentials

1. All forms of inclosed drive permissible.
2. Four-speed gearsets, direct on high.
3. Lowest gear ratio not less than 40 to 1.
4. Large engines required, 312 cu. in. on 1½-ton model and 414 for the 3-ton.
5. Minimum clearance of 9¾ in.
6. Only demountable tires acceptable, all of 36 in. diameter.
7. Electric-lighting system necessary.
8. Engine must have three-point suspension.
9. Some form of locking differential necessary.
10. Tread varies from 58½ to 61½ in., according to size of tire.
11. Large brakes must be provided.
12. Large-capacity radiators are necessary.

A requirement which is of vital importance is the load capacity. Nominally, for a 1½-ton truck, it is stated that the pay load should be estimated at 4000 lb. to allow for the rough usage likely. The body allowance is 1050 lb. for the standard army body, while three men and truck equipment total 725 lb. This makes a total load on the chassis of 4775 lb., or 1000 lb. more if the pay load is taken to be 4000 lb. instead of 3000 lb. Thus it would, perhaps, have been more fair to have called it a 2-ton truck. The chassis weight is limited to 6000 lb.; so the whole vehicle when loaded would have a maximum weight of 10,775 lb. For two-wheel driven trucks it is further desired that of the weight of the pay load not less than 80 per cent nor more than 95 per cent should be on the rear axle.

One of the points about which the hottest argument has raged is that of governing. The trucks sent to Mexico mostly had to have the governors removed because with them the engine could not be accelerated enough on low gear to pull out of the sand holes. Without the governor, however, the speed on high gear was destructive. In the original specifications drafted last year 14 m.p.h. was the limit set; now it is raised to 15 m.p.h., with the proviso that the engine speed must, at the governed speed, be such that the requisite power on low gear is still available. This is still further made evident by the clauses which define the minimum tractive effort at the rear wheels which will be accepted on both high and low gears.

Tractive Factor

Herein the specifications introduce a rather novel phrase, that of the Tractive Factor. This factor is the result of dividing the tractive effort at the contact of tire and road by the total weight of the loaded vehicle. It must be not less than 0.0775 on high gear, nor less than 0.338 on low gear.

Lubrication must be by pressure, with an oil pump delivering 30 lb. as a minimum at 800 r.p.m. The arrangement of valves is not limited; they may be set in L, T or overhead fashion, but, whichever the kind of cylinder, they must be completely inclosed. One detail noticed is that laminated shims must be used

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and not the old-fashioned type. For pistons iron only is acceptable, and the nature of this iron, together with that for the cylinder casting, is defined. The piston rings must be S. A. E. standard; in fact almost every one of the immense list of S. A. E. standards that are applicable seem to have been adopted. All the steel specifications, the details of heat treatment, and many other like subjects are dealt with by referring to the S. A. E. standard.

Dust Extractors

Mexican experience is seen in the demand that both main and auxiliary air intakes to the carbureter, and also the crankcase breather, be fitted with dust extractors. These must not require water, must be effective, must be easily cleaned and yet not require very frequent cleaning. The raw materials are particularized rather minutely, but in such a way as not to limit design very much.

Apparently the army expects to get good gasoline, for the limitations placed upon the ability of the carbureter are less than those found in commerce. Gasoline with a starting point of distillation 122 deg. Fahr., a 90 per cent point of 350 deg. and an end point of 400 deg. must be utilizable, say the specifications, but much of the gas we are buying to-day is much heavier than this, with end points of 450 or higher and a 90 per cent point around 400.

The gasoline tank must hold 30 gal. and a partition must be used dividing the bottom half of the tank into two, so that at least 6 gal. is retained on either side of the partition. A three-way cock allows fuel to come from either side, but whichever is in use the reserve will still remain at 6 gal. Either gravity or pressure feed is permitted, the limitation being that the fuel must feed freely when the truck is climbing a grade of 25 per cent or worse and with a minimum amount of gas in the tank. Practically this would seem equivalent to demanding a pressure feed or something of a similar nature.

There must be dual ignition, magneto and battery, but one distributor in the magneto and, of course, one set of spark plugs will be accepted. A generator is called for, and also provision must be made for mounting a starting motor, and the flywheel must have the gear ring ready for the starter, but a motor is not to be fitted as standard. For the magneto a standard coupling and mounting with a strap for holding the machine in place must be used, and a drawing is issued with the specification showing dimensioned details of this. The purpose is, of course, to make the magnetos interchange readily from truck to truck. It is specified that the drive for the magneto be such and the couplings so arranged that such interchange is facilitated.

Single-System Wiring

For wiring the single system is to be used throughout, except that the dash lamp and tail light are to be in series. There is to be a 10½-in. searchlight mounted within the driver's reach, adjustable to any angle and supplied with a 21-cp. tungsten bulb, quite a powerful sort of a spot light in fact. In addition combination oil and electric sidelamps and a trouble lamp are required.

For clutch a dry disk pattern with one or more disks is specified and unit power plants will not be accepted. The four-speed transmission must be mounted separately and the interconnection so arranged that the clutch can be removed completely without disturbing engine or transmission case. It is further stated that there must be two universal joints in the clutch coupling and these must not be fabric or leather disks. Gear shift for the four speeds must be in accordance with the S. A. E. standards, as must the other details of the control, but nothing is said as to whether the steering wheel be right or left. The S. A. E. standard provides for brake and gear levers on the driver's right, irrespective of the wheel position.

Brakes have a good many paragraphs devoted to them. The fact is that it is almost impossible to make truck brakes large enough to give as good service as those on passenger cars, so great stress is laid on facile adjustments which must not need special tools. The emergency brakes must be on the road-wheel drums, but the service brake may be either on the wheels or the transmission. There is a somewhat severe clause asking that either of the brakes be powerful enough to slip the wheels or to bring the truck to rest within 50 ft. when running on macadam at 15 m.p.h. There is nothing said as to the length of grade down which the brakes must hold without artificial cooling, a matter that was much argued at former meetings when discussing the old specifications.

A very interesting point is the selection of demountable tire equipment, because this is made after much experience and with an eye to the longest service without changes. The 1½-ton truck with two-wheel drive is to have 36 by 4 single, solid, demountable tires on the front wheels and single, solid demountables 7 in. wide on the rear wheels. Four-wheel drive trucks are to have 36 by 6 in., front and rear, but again single tires and not duals. In the 3-ton specification, which is but a short appendix to the 1½-ton, specifying the differences, the tires called for are 5-in. single front and 36 by 5-in. dual rear. For the attachment of the demountable tires a standard drawing in accordance with S. A. E. practice will be issued by the war department.

Tire Diameter

For both sizes of truck there is only one tire diameter, 36 in., and only four different sections, 4, 5, 6 and 7 in., covering both two and four-wheel drives, making stock-keeping very simple.

There is no need to recapitulate further; the main points have been dealt with and the specifications themselves may be studied for minutiæ.

Of course there is opportunity for criticism; the writer, for instance, regrets the poppet valve limitation because the Knight engine has done so splendidly in European truck service; but to pick to pieces the specifications in detail would serve no purpose, and from experience of the meetings last summer it may be said with conviction that there is not a clause in the whole series which has not been fully thrashed out in discussion.

Next year, for 1918, the specifications are to be revised, and yearly revision is intended. Possibly the requirements may be made more stringent, possibly the freedom given will be increased, but the present specifications do seem to embody as essentially vital points all those things which really make for reliability and convenience in army work, leaving the detail fully to the engineer and manufacturer. One thing is very clear. The United States army truck has got to be a high-grade production.

Complete U. S. Army Truck Specifications Appear on pages 34 to 44

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Truck Specifications from the Owner's Angle

OWNERS of motor trucks in commercial service should realize that a truck built according to the specifications of the United States Army trucks published in this issue need not of necessity be a vehicle best suited to their needs. As users of motor trucks, let us not lose our heads in this time of national crisis and demand trucks patterned after what the military authorities believe is the best type of vehicle.

These army specifications are admittedly based, at least in part, on our experience in Mexico, where, due to the almost entire absence of roads, it was a crime to run any kind of motor truck. Commercial users of trucks throughout the United States have learned that they cannot make money running trucks over roadless country. Europe very soon learned the lesson that motor trucks need roads. Both France and Italy soon found that it was far cheaper to build good roads than to bring out new models of super trucks. Since the beginning of the war, Italy has had a force of 20,000 men continually engaged in building new roads. Similarly, the transportation of ammunition and men required for the successful defense of Verdun by the French was accomplished over a road especially built for truck use.

So it is with America. We need better roads rather than stronger trucks. Let us demand that we have real motor truck roads instead of new models of trucks patterned after army specifications.

While it is safe to assume that some good to the commercial user will come out of the new army truck specifications, it is certain that trucks built along the lines laid down will have many attributes not necessary for ordinary commercial usage. It is also certain that trucks built to these specifications will be expensive—that cost will be a second consideration—and to what end, merely to have reserve strength and power for extreme conditions under which experience has taught us the use of the truck is not economical?

It is doubtful whether the larger radiators and the more powerful engines required in the army specifications are needed in commercial service and whether having them would not decrease the vehicle efficiency under ordinary conditions, besides increasing the price out of proportion to the benefits accruing. It is also doubtful whether the ban against single ignition and unit power plant assembly does not increase the price of a truck out of proportion to the cost for everyday service over fair roads.

The requirements on brakes are perhaps too severe for usual truck service, yet there is no doubt that brakes on many of our trucks could be larger and of a more efficient self-cooling type. Four-speed gearsets offer a great range of speed, although the minimum low gear ratio of 40 to 1 is very much lower than is commonly desirable on trucks in everyday work. Stronger and better-designed steering pivots and steering gear are necessities.

Metal wheels, with their greater shape-holding characteristics, undoubtedly provide an advantage over the wood type, although it is not quite plain why metal instead of cast steel wheels should not have been specified.

It is striking that the limitations placed upon the carbureter are less stringent than those found in commerce, but possibly the government will demand and secure a better grade of gasoline than can be obtained by the average small user.

The requirement that the tread or gage of the trucks shall only vary from 58½ to 64½ in. is a step in the right direction and one which should prove of as much value to the truck in commerce as in war work.

A standardized tread, while it might impair the usefulness of the smaller trucks, would be good for motors as a whole, because it would obviate the necessity of each different size or make having to break down a new track in those poor roadways which trucks must use until better thoroughfares can be built.

The specifications contain many details, such as easily-removable engine shields; means to drain a flooding carbureter without having any of the fuel drip into the engine pan; suitable bumpers and efficient radiator guards, all of which should prove of equal value to the ordinary user and to the army. If proven of practical value, truck manufacturers will automatically include such design in their stock models. But in the meantime let us focus our aims in a demand for more and better types of roads really suitable for truck use every day of the year so that the trucks we now have can be operated with less repairs due to poor roads and at higher rates of speed than are now possible on such highways.

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Truck Show on Coast Draws Thousands

Dealers' Association Result of San Francisco Event

SAN FRANCISCO, CAL., April 17—With the Coast Artillery Military Band playing "The Star Spangled Banner," and 7000 people waving American flags, the first truck show ever held in San Francisco came to a successful close promptly at 10.30 this evening.

The event proved a success beyond the most sanguine expectations of its promoters. The average daily attendance exceeded 4700, and every exhibitor reported sales.

The show was conceived and promoted by Ivan R. Gates, who has directed several salon shows in California, and was held without the sanction of the Motor Car Dealers' Association of San Francisco. The withholding of the sanction prevented association members from exhibiting, but in spite of the opposition, the exhibit was the largest display of commercial vehicles ever held west of the Missouri River.

In most instances the expense of the exhibits was shared jointly by the manufacturer and the local dealer; and in all 21 dealers combined to display 52 models of commercial vehicles. A canvass of the exhibitors showed that the great majority thought the affair thoroughly worth while.

The Rainier, exhibited by the Reliance Automobile Co. of San Francisco, and the Denmo, Model 10, shown by the Butler-Veitch Co. of Berkeley, were on public exhibition on the Coast for the first time. A fleet of six Morelands, a 6-ton Doane finished in red and blue, a 4-ton of the same make, two Hewitt-Ludlows, on one of which a huge machine gun had been mounted, a new model De-Martini, and a 2¼-ton Kleiber represented the product of San Francisco's factories.

The International Harvester Co. showed four models; five Indianas were displayed by the Motors Distributers Co., and the Reliance Automobile Co. exhibited two Rainiers and three Gramm-Bernsteins.

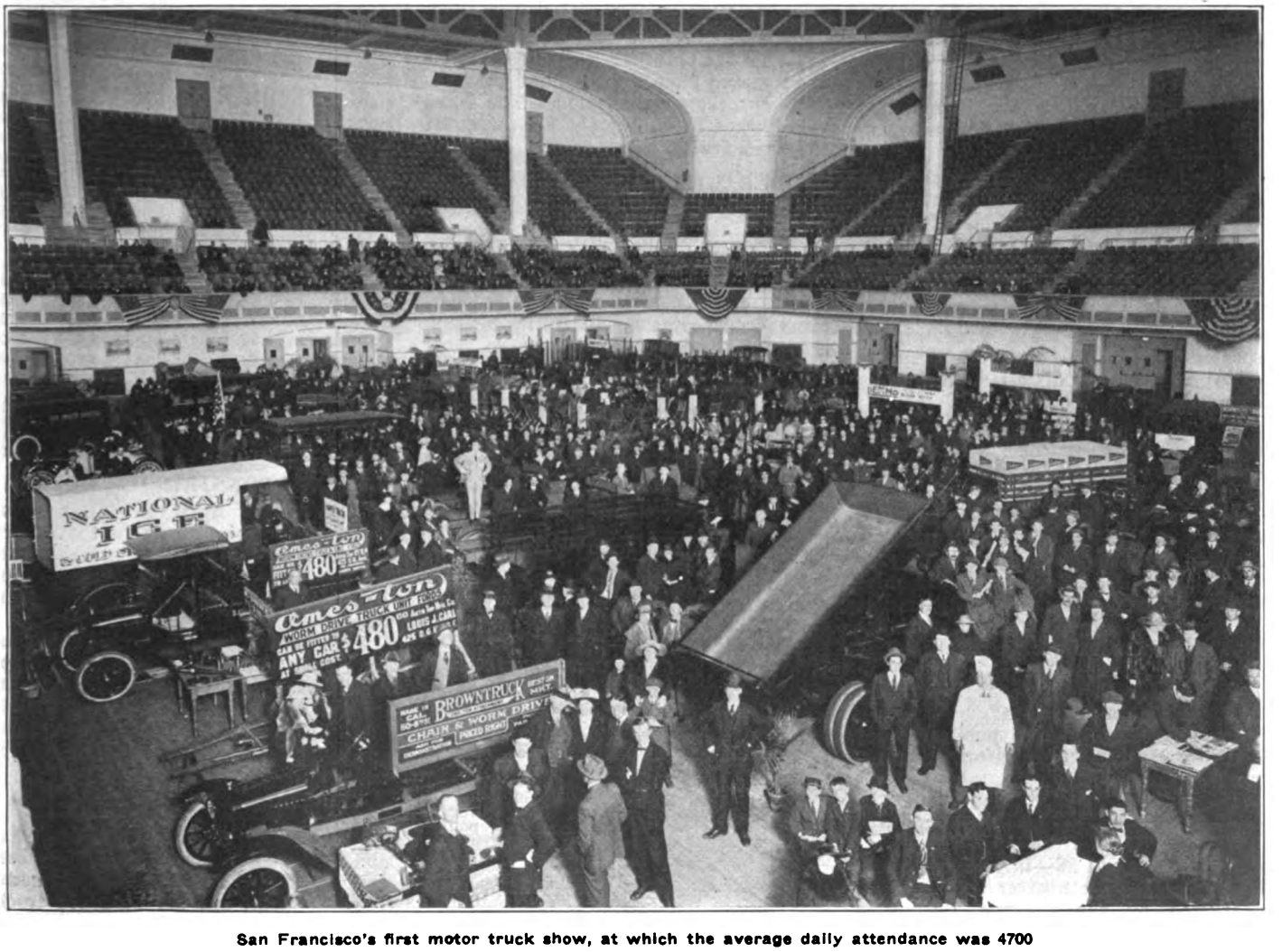
Practically every Ford adapter sold or manufactured on the Pacific Coast was on display, and the exhibit of the Smith Form-A-Truck was the center of attraction at all times. Home industry was represented by the Ames, Brown and Industrial. Marx Brothers had a well arranged exhibit, consisting of three Hudford attachments.

England Still Buying U. S. Trucks

789 Vehicles, Value $2,311,344, Left N. Y. in March

NEW YORK, April 24—Exports of trucks from the Port of New York increased in March measurably over the February figure, despite the U-boat warfare. There were 789 commercial vehicles shipped from the port in March with a valuation of $2,311,344 as against 604 in February with a valuation of $1,680,011. The greatest factor in the growth of exports was the English trade, which absorbed 596 trucks in March, more than two and one-half times the February number, which was 234. The valuation of trucks sent to England in March was $1,862,535 as against $692,691 in February.

The British Government records show, however, that there has been a slump in the registration of commercial vehicles in England since the beginning of the year. The decrease was sharp in 1915 with an upward trend last year which almost reached the before the war figures. The total registration for 1914 was 22,191, for 1915 it was 15,656, and for 1916 the total was 21,358.



San Francisco's first motor truck show, at which the average daily attendance was 4700

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Competition Lacking in Gasoline Sales

Federal Trade Commission Asks New Legislation

WASHINGTON, D. C., April 24.—Increased demand and the domination of the gasoline industry by the Standard Oil interests were found to be the chief factors in the gasoline high price situation, according to the report of the Federal Trade Commission transmitted to the Senate to-day.

Despite dissolution of the so-called "Oil Trust" by the U. S. Supreme Court, the Commission concludes that Standard Oil domination has had a "fundamental bearing" upon gasoline prices, declared to have been arbitrarily increased.

In an exhaustive report of its investigation, under resolutions of Senators Gore and Owen of Oklahoma, and its statutory authority, the Commission declares, in substance, that real competition does not exist betwen the various Standard Oil companies because of interlocking stock ownership through the holding of a majority of shares in the constituent Standard companies by identical interests.

Legislation to meet these conditions is recommended by the Commission. Also its evidence and findings have been transmitted to the Attorney General for appropriate action.

Recommendations of the Commission with a view to preventing or remedying conditions include:

A law providing for the reopening of anti-trust cases on the application of the Attorney General by a bill of review for the purpose of securing such modifications of decrees as new conditions may require.

Abolition, by legislation, in certain cases, of common stock ownership in corporations which have been members of a combination dissolved under the Sherman law.

Effective limitation upon common ownership of stock in potentially competitive corporations by withdrawing the power of voting and control.

Legislation which, while recognizing common ownership, would fix upon such common owners the responsibility for the acts of each of the several companies so owned, which prevent competition.

Segregation of the ownership of the pipe lines from the other branches of the petroleum industry.

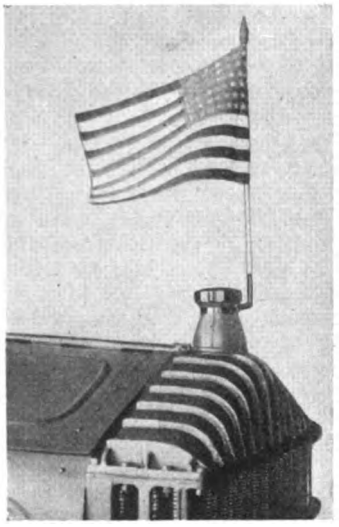
Fixing, by Congressional legislation, of standards for "gasoline."

Federal collection and publication of accurate statistics and information regarding the industry.

NEW LITTLE GIANT ADAPTER

CHICAGO, April 26—In addition to its line of trucks a converter is now being marketed by the Chicago Pneumatic Tool Co., maker of the Little Giant motor vehicles. This new device is called the Convert-a-Car and is a 1-ton truck unit intended for use with a Ford.

No parts of the Ford are cut or destroyed. The only extra equipment needed is a pair of Ford rear hubs on which to mount the sprockets. The rear wheels are removed from the Ford and the hubs with sprockets substituted. The Ford axle is then lifted into the hanger under the truck frame.



Flag Holders for Trucks

Patriotic truck owners wishing to fly Old Glory on their vehicles may purchase the flag holder shown above at 25 cents each. It fits all radiator caps and is made by the Shattuck Mfg. Co., New York City.

STUDEBAKER BUILDS AT SAGINAW

SAGINAW, MICH., April 24—The Studebaker Corp. of America will erect a large assembling plant at Saginaw and will employ 700 men here. This plant will be established in an effort to overcome transportation difficulties arising from freight-car shortage.

DUPLEX FACTORY AT LANSING

LANSING, MICH., April 24—The Duplex Truck Co. will erect a factory here 72 x 608 ft., two stories high, with a basement.

Coming Events

May 11.....Detroit, Sectional Meeting of the S. A. E.

May 15.....Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.

May 16.....New York City, Monthly Meeting of the Motor Truck Club of America at Noontime.

May 16.....Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.

May 17.....New York City, Monthly Meeting, Metropolitan Section S. A. E. Automobile Club, 247 West Fifty-fourth Street.

June 26-27.....New York City, Summer Meeting S. A. E. Bureau of Standards.

Electric Truck Makers Start Campaign

New York Convention Outlines Methods

NEW YORK, April 20—Electric truck and car manufacturers took the first step in securing definite concerted action by the entire industry on a national educational campaign at a meeting held here yesterday. Plans for merchandising the electric commercial vehicle were developed in detail.

The main points of the campaign are:

1—All divisions of the industry to raise a fund to engage an experienced man to take charge of the propaganda, working under electric vehicle makers; yearly cost, about $20,000, manufacturers to pay $1,000 a year each, and balance of 25 per cent to be supplied by central stations through N. E. L. A.

2—A booklet to be prepared for distribution to the central stations, setting forth the history, potentialities, and possibilities of the electric vehicle business.

PRICES OF FIVE TRUCKS INCREASED

NEW YORK, April 24—Packard, Mack, Service, Pierce-Arrow, White and Indiana trucks have increased in price. The former and the current prices of the various makes and models are as follows:

Make	Model	Old Price	New Price
Mack	1-ton	$2,150	$2,250
Mack	1½-ton	2,500	2,700
Mack	2-ton	2,800	2,900
Mack	3½-ton	3,650	3,750
Mack	5½-ton	4,250	4,500
Mack	7½-ton	4,600	4,800
Service	1-ton	1,375	1,425
Service	1½-ton	1,950	2,100
Service	2-ton	2,250	2,350
Service	3½-ton	3,000	3,100
	(Special)		
Service	3½-ton	3,250	3,350
Service	5-ton	4,000	4,150
Indiana	1-ton	1,385	1,550
Indiana	2-ton	2,100	2,250
Indiana	3½-ton	2,750	3,000
Indiana	5-ton	3,600	4,000
Pierce-Arrow	2-ton	3,000	3,300
Pierce-Arrow	5-ton	4,500	5,000
White	¾-ton	2,100	2,300
White	1½-ton	3,000	3,300
White	3-ton	3,700	4,100
White	5-ton	4,500	5,000

GRAMM-BERNSTEIN IN GOTHAM

LIMA, OHIO, April 26—All sales of Gramm-Bernstein trucks in the eastern territory will be handled in the future by the Gramm-Bernstein Sales Corp., New York, a factory branch of the home office.

This arrangement follows the former connection with the R. E. Taylor Corp., which has gone out of existence. The ground floor of the building at 614-620 West Fifty-seventh Street will be utilized as a display room and service station. The executive offices are at 1457 Broadway.

MACK SELLS 150 BIG TRUCKS

NEW YORK, April 17—One hundred and fifty 5½-ton Mack trucks have been ordered by the British Government. These vehicles are the standard trucks produced by the International Motor Co.

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Standard Roller Bearing Plans Expansion

Financial Aid Assures Large Scale Production

PHILADELPHIA, April 20—The Standard Roller Bearing Co. will go into the manufacturing field on a larger scale of production with increased facilities. Financial aid has been assured by the investment of approximately $500,000 by the Marlin Arms Corp., which recently bought the S. R. B. property. The company is now in a position to proceed with its plans, as the receivers have been removed and the creditors have all been paid. Though the Marlin company owns the stock of the company, it will be operated under its old name.

A new plant is under consideration, the location of which has not been decided upon. F. N. Germaine, who has been prominent in the activities of the company, remains as general manager. The organization remains approximately the same.

At the time of the sale of the S. R. B. property to the Marlin people, the Rockwell-Drake Corp., Fairfield, Conn., was also sold to the arms concern. The Rockwell-Drake Corp. manufactures machinery used in making ball and roller bearings. Thus this acquisition will be of especial value in pursuing the expansion plans that are in contemplation.

The manufacture of annular, thrust and double row ball bearings and wire wheels and balls will be continued. Included in the policy of the new organization will be a service department. Bearings will be carried in stock and service stations will be established throughout the country to insure prompt deliveries. A branch office will be established in Detroit.

HIGHWAY, NEW TRAILER

EDGERTON, WIS., April 18—J. W. Menhall, formerly vice-president of the Warner Trailer Co. of Beloit, has organized a trailer manufacturing company, which has taken over the property of the Edgerton Wagon Co. The new concern is called the Highway Trailer Co. and will produce two- and four-wheel trailers for general highway use.

NEW TRAILER HAS BRAKES

COLUMBUS, OHIO, April 25—The Automatic Control Trailer Co. has been incorporated with a preliminary capital of $25,000, to build trailers and equip all trailers with an automatic braking device, the patents of which are controlled by the company. The incorporators are H. C. Rogers, John H. Price, S. A. Kinnear, C. W. Seaman and John G. Price.

AMERICAN CO. TO MAKE TRUCKS

DETROIT, April 24—The American Motor Truck Co. has purchased a factory plant which it is converting for truck manufacture and has commenced the installation of machinery and material. The company claims it will have 24 trucks under construction by May 15. The new factory is a one story brick structure with 40 square feet of floor space. The truck is made of standard materials, including the Continental motor, and is manufactured in 2, 3½ and 5 ton models, all of which sell for more than $3,000 each.

GRAMM-BERNSTEIN CO. REDUCES CAPITAL STOCK

LIMA, OHIO, April 25—Papers have been filed with the Secretary of State reducing the authorized capital of the Gramm-Bernstein Motor Truck Co. from $4,000,000 to $1,500,000. The original capitalization of the Gramm-Bernstein interests was $500,000 under the name of the Gramm-Bernstein Co. The company last year expected to sell stock on the open market and increased the capitalization to $4,000,000, taking the present name. The business increased at such a rate, however, that outside financial investment was found unnecessary, and the company decided to reduce its capitalization accordingly.

S. A. E. CHANGES MEETING

NEW YORK, April 20—Because of war conditions, the Summer Meeting of the Society of Automotive Engineers, scheduled to be held the last week in June at Ottawa Beach, Lake Michigan, was called off by the Council of the Society at a meeting held a few days ago in Chicago.

Instead of four days at Ottawa Beach it was voted to spend one day on the Summer Meeting and hold it in Washington, D. C., on Monda y, June 25. Washington was selected because many Government departments are closely associated with the work of the society.

S. A. E. OFFICE IN WASHINGTON

CHICAGO, April 17—A Washington office of the Society of Automotive Engineers will be opened in the Munsey Building in connection with the Council of National Defense as soon as arrangements can be made. This action decided upon by the council of the society in session here yesterday and to-day was brought about by the closer co-operation of the society with the various Government departments, which work is increasing every day.

TIME-PAYMENT PLAN CHANGES

NEW YORK CITY, April 26—The necessity for the financial policy of concerns handling time-payment paper for truck dealers being clearly defined was shown when two of the companies engaged in that work decided to discontinue, for the time being, the further handling of the paper. These were the National Bond & Investment Co. and the Empire Securities Co., both of Chicago.

The Bankers Commercial Corp., New York City, will not accept any further paper on passenger cars, but has not withdrawn so far as trucks are concerned. Other concerns which are continuing in the work without serious modification due to war finances are:

Guaranty Securities Corp., New York.
Agricultural Credit Co., Chicago.
Commercial Investment Co., Chicago.
Commonwealth Finance Corp., New York.
American Commercial Co., Cleveland.

New York Would Double Truck Tire Sizes

Truck Club Showing Folly of Proposed Measures

ALBANY, N. Y., April 20—All motor trucks now in use in New York State would be legislated off the roads if dual bills introduced by Assemblyman Kasson and Senator Robinson are made into law. These bills would require that every truck mounted on solid tires be provided with tires double the width of those now used, the allowable maximum wheel loads being from 25 to 50 per cent less than those recommended by all solid tire manufacturers.

Besides the tire load capacities proposed, the bills also seek to limit the gross weight of all vehicles to 28,000 pounds, except by special permit; the gross weight on any axle to 20,000 pounds; orders total weight signs or plates attached to each vehicle; limits the length to 28 ft. and width to 8 ft., and regulates the speed according to the tire width. All of these proposals seem to be satisfactory except that regulating the speed according to the tire width, for some trucks using singles in the front and duals in the rear would be restricted to two different speeds.

KENTUCKY BOOSTS TRUCK TAXES

LOUISVILLE, KY., April 23—The Mathers Bill, with provisions that motor trucks be taxed $12 for those below 3-ton capacity; $50 for 4-ton; $65 for 5-ton, and $100 for 6-ton trucks and over, was passed after several hours of argument in the House of Representatives yesterday afternoon. Final vote on passage of the bill was 45 to 43. The bill would raise about $45,000 a year, it is estimated, the revenue to go to the road fund. Trucks used by farmers in taking their produce to market are exempted.

POSTAL OFFICE ASKS TRUCK BIDS

DETROIT, April 18—Sealed proposals will be received at the Washington office of the postal department purchasing agent until 10 o'clock on the morning of April 25 for furnishing ⅜-ton, ¾-ton, 1½-ton and 3-ton gasoline automobile trucks and motor vehicle supplies for use of the postal department. Blanks for proposals with specifications and instructions, including blueprints, may be obtained from the purchasing agent.

BOSTON USES OWN POSTAL TRUCKS

BOSTON, MASS., April 21—Postmaster William F. Murray has taken over the entire distribution of mail in Boston for the Government, and is arranging to have it done through Government-owned motor vehicles. He has sent out bids for a garage of 30,000 sq. ft. of space in which to house all the machines.

Postmaster Murray has made a very close study of the work and he believes in the superiority of trucks over horses. The new regime will go into effect shortly.

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Army Needs 1360 Truck Drivers at Once —Enlisted as Sergeants in Reserve

Motor Truck Club Undertakes Recruiting Work—Stations in New York, Boston and Philadelphia—Others Soon

THROUGH orders issued from the War Department in Washington and transferred through Maj. Frank H. Lawton, Quartermaster Corps, Department of the East, the Motor Truck Club of America has been called upon to undertake the work of obtaining the crews of forty motor truck trains for army work. These men are to be recruited into the Quartermaster Enlisted Reserve Corps and will enlist for a 4-year period with but 15 days' compulsory service yearly, if so ordered. They will not be called to active service for the government until such time as an emergency arises. This may be at any moment now, in view of the training camps to be established all over the country beginning May 1.

As thirty-four drivers are to be recruited for each truck train, the total number to be secured will be 1360. While this number seems comparatively small and easy to obtain in the large territory of the Department of the East, stretching from Maine on the north and Alabama and Florida on the south, it is nevertheless a real man's-size job.

While this small number is asked for at the present time, it will be but a drop in the bucket as compared to the number which will be required to transport materials and supplies for the first 500,000 increment of the new army which the government plans to raise by conscription.

40,000 Drivers Will Be Needed

Under the ordinary method of organization one truck train is sufficient to serve the needs of a war time regiment of 2000 men. If 500,000 are to be served, it will require the enrollment of 8568 drivers and 17,136 for an army of a million. This figure does not include the large number of trucks which will be required to furnish ammunition for the guns with which this army will be equipped, and it is estimated that between 35,000 and 40,000 trucks and drivers will be required should the United States eventually send an expeditionary force to Europe.

Under the able leadership of Roderick Stephens, president of the club, who is also a member of the Volunteer Motor Transport Committee working under the advisory commission of the Council of National Defense, committees have already been formed to carry on this work in New York City and in Boston, and other committees are now in the course of formation in Philadelphia and in Atlanta, Ga. The purpose of these various committees is to obtain applicants capable of driving army trucks and of examining such men and passing upon their fitness. The latter work is being done by examining boards working under the direction of the general committee. The New York committee, which will undertake to carry on the work in the States of New York, Pennsylvania, New Jersey, Maryland, Virginia and West Virginia, is composed of the following:

George H. Pride, chairman.
Emlen S. Hare.
Thomas F. McCarthy.
Joseph K. Orr.
George H. Duck.
Arthur J. Slade.

Joseph Husson, editor of THE COMMERCIAL VEHICLE, is secretary and executive member.

This committee has undertaken to form other committees in the States mentioned to carry on the enlistment work in the localities in which they are located and to form local examining boards at which applicants may present themselves. C. A. Musselman of Philadelphia is forming a committee in that city to obtain recruits in Philadelphia and in Camden, N. J.

Boston Is New England Headquarters

A similar committee has been formed in Boston to obtain recruits in the six New England States which will form the Northeastern Department of the present Department of the East on May 1, 1917. The personnel of that committee is as follows:

Major Harry G. Chase, chairman.
Lieut. P. C. Baker.
E. J. Sampson.
Day Baker.
Cornelius Beard.

Captain F. J. Burnham is secretary and executive officer.

Roderick Stephens is now absent on a trip to Atlanta, where he will form similar committees to take hold of the work in what will be the Southeastern Department of the present Department of the East and which will include North Carolina, South Carolina, Georgia, Florida and Alabama.

It is not the intention of the various committees to recruit drivers solely from the ranks of present-day drivers, as that procedure would seriously cripple the present industrial transportation life in the localities from which such men were taken. It is rather the intention to obtain enlistments from among the ranks of those who own or drive their own cars and from college graduates who could be made into drivers of the highest class after a short period of training. Such men as those who volunteered for the American Ambulance Corps in France and Italy would make exceptionally good drivers for this work. It would provide just as many thrills and is almost as dangerous as work with rifles or machine guns in the first-line trenches for the reason that practically all of the field artillery in present-day warfare is served almost exclusively by motor. Convoys are often shelled by long-range guns when their positions have been spotted by airplanes.

Besides this, the service offers opportunity for the most rapid advance of any branch of the army for the reason that our present military organization contains no department of mechanical transport. It is almost certain that those drivers who show ability in the first few units made up into truck trains will be promoted to become truck masters or even captains to take charge of the additional trains as formed, as the size of our army is increased. Again the truck drivers are enlisted as sergeants instead of privates and are thus able to advance more rapidly than if they entered the service at the lower rank. An enlistment station for the Department of the East has been located at Governors Island, but will be moved to the United States Rubber Co.'s office at 1790 Broadway, New York City, where application blanks may be secured. The local examining board, which consists of George H. Pride, chairman; Emlen S. Hare and George H. Duck, secretary, will be located at the office of the Motor Truck Club at the same address and where a United States army surgeon and recruiting officer will be on hand to swear in any applicants who pass the test of the examining board and the physical test as given by the army surgeon. Other recruiting stations will be opened in Boston, Philadelphia, Washington, Buffalo, Rochester, Syracuse and various cities throughout the entire present Department of the East.

Applicants for enlistment as truck drivers must be between the ages of 18 and 45. They must be of good antecedents and habits, and be free from bodily defects and diseases. They must be citizens of the United States or have made a legal declaration to become citizens of the United States, and be able to speak, read and write the English language. They must furnish two certificates of good moral character, with particular reference as to sobriety and as to experience, and in addition will be examined by the special examining boards already referred to.

Quartermaster Reserve Corps

Enlisted men of the Quartermaster Enlisted Reserve Corps will be required to keep themselves physically fit for military service for a period of 4 years and to attend each year, if ordered to do so, an army encampment for 2 weeks only, for which duty they will be paid. They must also hold themselves in readiness for actual duty at the proper place in time of actual or threatened hostilities in answer to the call of the President of the United States. Men who enlist in this reserve retain their status as civilians and are only required to leave their homes to attend an encampment in time of war or threatened war.

Truck drivers in the enlisted corps will be recruited as sergeants at the rate of $36 a month, and will have their railroad fares to and from their homes paid by the government while traveling. They will be supplied with uniforms the same as prescribed for enlisted men of the Quartermaster Corps of the regular army reserve, except for insignia. In addition to the above 1360 sergeants required as truck drivers, the Quartermaster's Corps, Department of the East, must also recruit the personnel for eighty wagon companies, seventy bakery companies and miscellaneous skilled workmen, bringing the total of the personnel required, including first sergeants, sergeants, cooks, corporals and first-class privates up to 5233 men.

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Requirements of U. S. War Trucks Determined by Our Experience in Mexico

Difference Between Europe's Hard Roads and America's Mediocre Highways Makes It Necessary That Our Trucks for U. S. War Service Be Stronger and More Powerful

By H. D. Church
Chief Engineer, Truck Department, Packard Motor Car Co.

¶This paper, read before the Cleveland Engineering Society on April 17, was submitted to the War Department, and in reference to it Colonel Baker stated, "I consider it a splendid paper, covering the essentials of the subject; giving an explicit idea of the aim of the department in the development of this truck." It will be noticed that the ideas herein contained agree closely with those of the specifications just issued by the War Department and printed in full on pages 34 to 44.

MOTOR trucks of American manufacture have played an important part in the present European War, but up to the present time our general design has not been materially influenced thereby.

The conditions on the western battle front in Europe are such that large armies have been practically in the same position for two years, and this fact, in conjunction with the first-class French roads, has made it possible for the conventional design of the American commercial motor truck to render fairly good service.

In other words, the commercial motor truck of to-day is essentially a hard roads vehicle, and when used over such roads would naturally not require any radical changes in design to meet military conditions.

In event of any fighting on American soil at any time for several years to come, it is most improbable that similar conditions to those outlined above would exist. Our borders are so long that permanent trench fighting on a large scale is most improbable, and the roads in this country are far inferior to those of France or Germany. It follows, therefore, that a truck designed for satisfactory military operation in this country, which means for use in connection with mobile field operations over mediocre roads, or in some cases no roads at all, must necessarily be of a design differing in many respects from our present type of commercial vehicle. Furthermore, the design of such a truck is bound to be influenced by the widely varying climatic conditions found in the United States proper.

During the trouble with Mexico, in the past year, our Army, for the first time, depended almost entirely upon motor transport, using quantities of the leading American makes of conventional commercial trucks.

From the standpoint of quick development of a suitable truck for American Army use, it is most fortunate that the operating and climatic conditions were extreme, as the result was to sharply define those points wherein a truck designed primarily for commercial service would not satisfactorily meet our military needs.

The experience of our Army with motor transport for the past several months has resulted in a vast amount of information as to desirable changes in design, and the Army has been most willing to extend to the engineers of the various truck manufacturers every facility to gather first-hand information on Army requirements for motor transport.

It is the writer's opinion that for American Army transport purposes, several different types of transportation will be required, according to topographical and road conditions:

1. Mule transport.
2. Caterpillar tractors.
3. Four-wheel driven trucks.
4. Two-wheel driven trucks.

Each of these methods of transport will probably be used, as each of them has a certain field of operation which cannot satisfactorily be filled by the other types. It is probable that the majority of the transport work will be done with two-wheel driven vehicles, as, where the road conditions will permit of its passage, this type will haul materials in the minimum time and at the minimum operating expense.

As the writer's direct experience has been largely with two-wheel driven trucks, this paper will be confined to consideration of that type, primarily of a nominal capacity of 1½ tons, this being the size which was most largely used.

Governors Are Essential

One of the first and most important points in connection with the design of a military truck is the absolute necessity for governors, not only to limit the maximum vehicle speed on high gear, but also to limit the maximum engine speed on any of the gears.

Experience along the Border with trucks which had never been equipped with governors by their manufacturers, as well as with trucks on which the governors had been removed to obtain more power, proved conclusively that a governor is even more necessary for trucks in Army service than for those in commercial service.

From personal observations made along the Border, it is the writer's opinion that the constant maximum engine speed governor is the proper type. This type of governor not only keeps the maximum vehicle speed down to a point where durability is assured, but it also keeps the engine speed down at all times, so that it is impossible to

Requirements of U. S. Army Trucks

1. Some form of enclosed drive.
2. Engine speed governors.
3. Large-capacity radiators.
4. Positively driven radiator fan.
5. Four-speed gearsets.
6. Standard control elements.
7. Metal wheels.
8. Standard tread.
9. Automatic locking differential.
10. Larger brakes.
11. Minimum road clearance of 10 in.
12. Means to keep dust out of all working parts.
13. Power-plant suspension to provide for extreme frame distortion.

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shorten the life of the motor by excessive speed when running on any of the geared speeds in the transmission. This is an important consideration for soft road operation where, if a governor which limits only the maximum road speed is fitted, there is a great temptation to the driver to run for long periods on second or third gear in the transmission with the engine racing, a practice which will materially shorten the life of the motor.

Governors must be thoroughly inclosed and sealed, to prevent their being tampered with without the knowledge of those in authority, and in order to obtain the best results, should be extremely sensitive, without "surging." A sluggish governor cuts into the power curve of the motor too early on acceleration and too late on deceleration, and experience has shown that a snappy governor action can be obtained within speed limits of 4 per cent on acceleration and 5 per cent on deceleration, which will utilize the maximum amount of horsepower for a given maximum governed speed.

Conventional Tractive Effort Inadequate

Consideration of governors leads directly to the question of ability or tractive effort, both on high and low gears. To obtain the best results over soft road conditions, and *without* disconnection of governors, the average American commercial truck has insufficient high gear ability and far too little low gear ability to successfully pull its load through deep sand or mud or over extreme grades.

The average truck designed for American commercial service has plenty of ability on both high and low gears to successfully handle its load over hard roads and over the grades found in American cities, but the conditions of operation for Army service in this country are much different.

The tractive effort required increases very rapidly with an increase in road resistance, and sand or soft going will not infrequently result in road resistances as high as 300 lb. to 500 lb. per ton, far in excess of anything ordinarily encountered in commercial service.

When it is considered that the road resistance in pounds per ton on good asphalt is 15, on macadam 50 to 60, and over ordinary cobbles 130, the necessity for an increase in tractive effort becomes very apparent.

For American military purposes, the low gear tractive effort should at least be sufficient to continuously turn the rear wheels of the fully loaded truck on dry asphalt with the truck itself stationary. Using a coefficient of friction between the tires and a dry asphalt surface of .6 and a total rear end loaded weight of 7600 lb. for a 1½-ton truck loaded to capacity, the low gear tractive effort necessary to meet these requirements becomes 4560 lb.

Commercial truck practice now gives far lower figures. For example: The low gear tractive effort of what is considered a powerful 1½-ton commercial service truck is only 2600 lb. To safely carry the low gear torque required to give 4560 lb. tractive effort, the driving members throughout, from the gear train in the transmission clear back to the rear tires, must be made heavier and stronger, which of course will result in an increase in chassis weight. From the standpoint of design, it is probable that any such increase in low gear ability for military service as outlined above will cause more changes in truck chassis design than any other one requirement, the necessity for which became apparent during last year's experience on the Border.

Radiators Must Be Large

The heat dissipating ability of the average radiator was found inadequate, a serious matter at any time, and more serious in a country where water is scarce. With the thermometer standing at 110 to 120 deg. Fahr. in the shade and the truck using maximum power on low gear for long stretches, extraordinary cooling ability is required. Probably an increase of 50 per cent over average commercial practice would not be excessive, and a desirable provision would be simple means for reducing the radiating area for efficient use in the cooler sections of this country.

When a truck is pulling along through heavy sand on low gear, its speed is so slow that the air circulation through the radiator resulting from the movement of the vehicle can practically be disregarded. This means that the radiator fan must handle a large volume of air in order to keep the engine cool under these conditions. In the writer's opinion this is not so much a question of efficient fan design as it is of furnishing some means of driving which will keep the fan up to its normal operating speed. The belts used for driving the fans on the average commercial truck are not sufficiently powerful to properly meet this condition, and either the size or design of belt will have to be changed, or some positive drive provided for the fan.

This is an important point, for if the radiator design is such that it depends upon the fan circulation to give a certain cooling ability, the result is seriously affected if the fan does not at all times draw approximately the volume of air that it handles when its belt is new and tight. A feature of the radiator which should be given careful consideration is its mounting, which should be such as to minimize any strains in the radiator proper which are set up as a result of excessive chassis frame deflection. Furthermore the radiator should be of a type which has large water passages, is least liable to break under distortion, and which is readily repairable in the field.

Four Speeds Desirable

Army experience on the Border clearly showed the desirability of four-speed instead of three-speed transmissions for military purposes. If the low speed reduction ratio in a three-speed transmission is made great enough to give proper low gear tractive effort, the steps between speeds become so great as to interfere with easy gear shifting. Furthermore, the four-speed gearbox has the very important advantage over a three-speed box for soft road service of always having a gear ratio more nearly adapted to any particular road requirement than can be obtained in a three-speed box.

It is probable that the gear ratios in a four-speed box for military trucks will be so arranged that second speed will be used for normal starting on hard road surfaces, and that the first speed, or low gear, will have a greater reduction ratio than anything which has been built to date. This high reduction ratio low speed gear will then be in reserve for starting or running in deep sand or mud or for climbing steep grades. In effect, such a combination of gear ratios would practically result in adding to a three-speed gear box of the conventional ratios an extra low gear with an extremely high reduction ratio, to be used for starting or running in sand or mud or for climbing steep or soft grades.

Standard Control Advantages

The desirability of standardizing the control elements has been clearly indicated. When large fleets of trucks are operated by a single user, particularly if the trucks are kept in operation for more than ten or twelve hours out of twenty-four, two shifts of drivers are necessary, and there is bound to be a certain amount of shifting of drivers from one make of truck to another. Where drivers are called upon to drive different makes of trucks, they should be able to do so with facility, and much time would be saved and better average operation assured if the same motion of the driver's right or left hand or foot could produce the same result irrespective of the make of truck. Standardization of controls along these lines would not only result in more economical and efficient operation, but would also simplify the instruction of drivers.

The use of all metal wheels will undoubtedly receive careful consideration as a result of Border experience, in spite of the fact that the wood wheels with which the majority of trucks were equipped gave remarkably good service. For desert running in the northern Mexican or southwestern United States climates, any wood wheel, no matter how good, will eventually loosen in the spokes and all-metal wheels are essential for durability in such climates.

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On commercial trucks of 3-ton capacity and under, steel wheels are not extensively used, due probably to the fact that for normal service wood wheels are perfectly satisfactory, and also because a set of steel wheels for a truck of 2-ton capacity or less will weigh approximately 125 lb. more than the corresponding wood wheels. For military service, however, which is bound to be extreme, any objection from the standpoint of slightly increased weight is more than offset by the necessity for durability under any climatic condition.

Wheel gage or tread is most important when numbers of trucks of different makes and sizes are operated over the same routes on soft roads, and trucks for American Army service ought to have a specified standard gage in order that each different size or make does not have to break down a new track in the roadway.

If all sizes of truck could be made to the present standard road gage of 56½ in., such standardization would be of the most value from a commercial as well as a military standpoint, as it would facilitate the operation of all trucks over soft country roads. Such a narrow gage is impractical for large trucks from 3-ton capacity and up, owing to constructional limitations. It would appear, therefore, that the best compromise from a military standpoint would be to ascertain how narrow it is practical to make the gage of the larger trucks and to then increase the gage of smaller trucks to a point where their tires will run within the tracks made by the wider tires of the larger vehicles.

From a commercial standpoint, this plan would slightly impair the usefulness of the smaller-sized trucks on soft roads, but if the gage finally decided upon is not so much above 56½ in. that the wheels on one side can obtain no advantage at all from one of the 56½ in. tracks on the road, the objection is not serious, while any approach to a narrower gage on present day large commercial trucks would somewhat help their performance over soft roads.

Final Drive Efficiency First Consideration

Such a standardization of wheel gage would be of immense value on trucks for military purposes, and in the writer's opinion would probably tend to increase the field of profitable operation for commercial trucks.

It is evident that the best results will be obtained from some form of fully inclosed final drive, which should be so thoroughly inclosed as to retain lubricant, and to prevent deposit of fine dust or grit on any of the working parts.

Whatever form is used, either worm, internal gear, or double reduction, it should, in addition to the foregoing requirements, be capable of efficiently and continuously transmitting the maximum low gear torque of the vehicle without overheating, and give at least 10 in. road clearance with 36-in. tires.

A highly desirable feature would be the use of some form of differential which will *automatically* prevent one wheel from spinning if it loses traction, and which will still function as a differential when the truck makes a turn.

The torque transmitting members throughout the rear axle, and through the entire driving train as well, should be able to stand up without overstressing, to withstand the sudden engaging of the clutch, with the transmission in low gear, the engine running at maximum governed speed, and the truck rear wheels locked.

The development of a braking system suitable for a military truck presents severe problems in regard to cooling. The brakes as used on our commercial trucks of to-day are not well enough cooled to stand up long under some military conditions, as for instance, handling the fully loaded truck on a three mile descent on a hard road surface with grades running up to 25 per cent and averaging 7 per cent.

Brakes as designed have sufficient power to hold the truck under such conditions, but will heat up so that the linings char slightly and wear rapidly. Water cooling is undesirable, and it is probable that some type of metal to metal brake will be necessary, which, while not so smooth in action and moister than the conventional brake faced with brake lining, will nevertheless give greater durability under continuous application.

It is essential that thorough means be provided to keep dust and grit out of all working parts. Troubles from dust are more liable to result on trucks in military service than on those in commercial service, due to running in fleets, or trains, over country roads.

Along the Mexican border, during the dry season, which means for the greater part of the year, there is an extraordinary amount of very fine, powdery dust, and a train of trucks running at twelve or fourteen miles an hour will raise a dust cloud which is visible for miles. This fine dust is drawn into the cylinders through the carbureter intakes, acting as an abrasive on the pistons, piston rings, and cylinder walls, and some is apparently drawn into the crankcase through the breather, mixing with the lubricating oil and causing undue wear on all working parts of the engine. Some form of separator or air strainer for both the carbureter and breather would be highly desirable, but it should be of a simple type, not requiring too frequent cleaning, and should not be of any form requiring water.

On a military truck, the question of road clearance is of great importance. Not only should a minimum clearance of 10 in. at the center of both the front and rear axles be maintained, but the clearances under the steering knuckle levers and the steering cross tube ends must be as great as possible. Furthermore, unusually high road clearance is desirable under the chassis, midway between axles, to prevent contact with the ground when the truck is driven over a bank into a river bed or over a ridge.

Results of Frame Distortion

To take care of excessive frame distortion, which is unavoidable when operating over rough or soft roads, the radiator, engine and transmission should be carried on three-point suspensions, and with clearances sufficient to obviate any possibility of their being themselves distorted. Provision should be made to protect the steering column from any binding from the same cause, and all connections between the rear axle and frame should be arranged to permit the maximum horizontal misalignment between the two without overstressing or breaking any of the connecting members. The gasoline tank mounting should also be carefully arranged to protect the tank from twisting strains.

It is impossible, without writing an unduly long paper, to take up all the points in the design of our conventional trucks which will be more or less influenced by military use.

Many other points will be affected, such as lubricating systems, carbureter design, steering gears, springs, body design and attaching means, etc., but the points discussed above are, in the writer's opinion, those which will require the greatest changes in design to render our commercial truck suitable for military use in this country.

The War Department has made a careful analysis of motor transport, and has drawn up a specification to cover desired design of two-wheel driven trucks for service with our Army. It is improbable that any subsidy plan for military trucks, similar to the English War Department subsidy plan, will ever be put into effect in this country.

In the absence of such a plan, it is probable that the U. S. War Department specification will stand as a master specification for American truck manufacturers, in that, as they bring out new models from time to time, they will incorporate in the design such features specified in the War Department specification as will not detract from the commercial value of the truck, and, at the same time, so design the other parts that, with minimum change, modifications could be added to meet the balance of the specification. If this procedure is followed, the War Department will eventually be able to purchase at comparatively short notice, trucks which much more nearly meet its requirements than anything on the market to-day, and furthermore, many of the features found necessary from Army experience on the Mexican Border will, if incorporated in our commercial trucks, materially enlarge their operating field.

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Motor Trucking Centers of America—VIII

PROVIDENCE

Motors, Compelled to Serve Large Dependent Territory, Modernize an Ancient City

PROVIDENCE, R. I., April 4—Probably the most densely populated city in the Western Hemisphere, and the distributing point for perhaps the third largest dependent territory in America, Providence is naturally a motor truck center. "Transportation is the life of trade," we are told and therefore where commerce is active, there too there must be much hauling and delivery. That one of the most conservative cities in the United States should use motor trucks extensively is not a paradox, for motor transportation is no longer an experiment. The fact that Providence is a big truck user proves this as well as anything could.

Providence never experiments if avoidance is possible. In kind with the typical spirit of the East, she leaves experiment to her younger sister cities in the West; but when the Down East business man is convinced he stays so. Providence has accepted the motor truck as the most efficient carrier in its field and daily experience is demonstrating just how wide this field is.

Install Trucks of Necessity

Motor trucks are used in Providence for just one reason: They are economical.

Physically, every circumstance militates against trucks. The streets are narrow and crooked. Traffic of all kinds has long ago outgrown the bounds laid down by the Puritans who followed Roger Williams. Paving is rather below the standard of other first-class cities. Hauls are of moderate length. The business section is hemmed about with hills.

Much Work for Trucks

Commercially, however, conditions are favorable to trucks, since as close neighbors to her, Providence has the teeming cities of Fall River, Woonsocket, New Bedford and the Attleboros, not to mention a host of smaller industrial centers. Shipping out of Providence is important, being the tenth port in order of volume of shipping in this country and the leading oil port of New England. In normal times, both transatlantic and coastwise trade clears from this port and with her neighbors, Warren, R. I., and New Bedford, Mass., Providence is a prominent fish and oyster market.

Providence is important in both the textile and machinery industries. She is the first city in the country in the manufacture of jewelry and silverware. Providence has the largest machine tool factory—Brown & Sharpe—file factory, locomotive factory—American Locomotive Co.—screw factory and silverware factory in the world.

Most of the important textile mills, whose total output is valued at $523,000,000, are within 50 miles of Providence.

The area of this city of 255,000 is but 18.29 square miles, or less than any other American city of more than 150,000 population. In the Metropolitan District, or greater Providence, as defined by the state are 548,477 souls. In an area equal to Greater Boston there are nearly 750,000 persons.

Thus, while in Providence proper there are 1209 commercial vehicles as of January 1, 1917, the majority of the 2855 trucks registered in Rhode Island in the same time are used in Greater Providence, or what should properly be part of the city itself.

Traffic Conditions Poor

Considering that there is but 253.21 miles of improved street in the city proper, and most of this mileage of unusually narrow width—some of the streets being only 20 feet wide—it will be seen that traffic must be dense. The condition is further complicated by the fact that this limited length is composed of no less than 1670 different streets laid out practically without any plan or order whatever, and running in every direction. Intersections assume every form conceivable and the house-numbering scheme is unintelligible to the stranger.

In length, it will be seen, these streets average but 1/7 mile in length and were it not that many street names are carried through the turns and twists of several streets, this average would be even less. The situation is saved by the existence of a number of arterial streets which run in various directions from the business center, by the fact that one particularly bad hill has recently been tunneled and that there is some activity looking toward the widening of the more important streets.

Tunnel Saves Hill Climbs

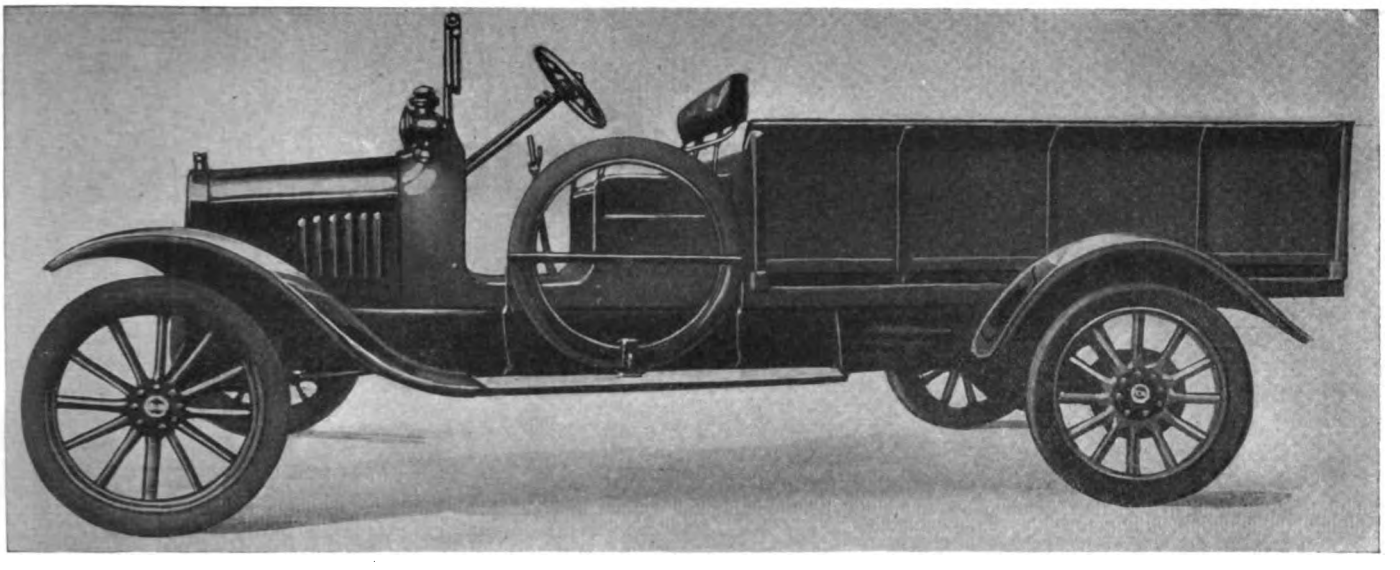
The tunnel is the East Side tunnel, cut through College Hill, ½ mile in length and providing a double roadway through to the east side district. One of the more recent street widenings is that of Fountain Street, a collection of old buildings being demolished and new ones taking their places some distance farther back than the old building line.

There is also a campaign under the guidance of the Providence Chamber of Commerce to lay out a new market center some distance from the old produce market where there will be more room, leaving the old location open to street-widening and improvement for business use. The reduction of traffic congestion which will result will unquestionably encourage the use of motor trucks in the



One reason why Providence streets are congested—Dorrance Street from City Hall at Exchange Place to Westminster Street, laid out as a wide street, has been cut into two narrow lanes by the erection of a freak building used by a pawnshop

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One of the experimental models of the new Ford truck which is being tested out on Detroit streets. Its price is predicted at close to $500, and it is thought that deliveries will be made during September, 1917

Ford Truck May Be Ready in September

Test Models on Detroit Streets—Price Near $500 —Has Worm Drive—May Use Kerosene Fuel

transportation of produce to and from the market.

Motor trucks are principally used in the wholesale and retail distribution of commodities in Providence, and to a great extent also in the building trades. That there is much use for them in the latter field is indicated by the fact that new buildings to the value of $7,053,600 were built in Providence in 1916 and $2,195,-300 was expended in additions and alterations, a total of $9,248,900 in building permits, or $2,225,200 above that of the year previous.

Has Many Fine Stores

Providence has many fine retail stores, among which is the Gladding Store, 150 years old, the oldest dry goods store in America. The trades which use the greatest number of trucks are groceries, department stores, bakers, brewers and liquor dealers, soft beverage bottlers, oil companies and motor vehicle supplies. Manufacturers, too, use motor trucks extensively. It is interesting to note that in Providence the haulage contractor and local expressman do not figure prominently. Most of the trucks operated here are owned by the firms using them. This is unusual, especially in New England.

Street Paving Poor

Most of the paving in Providence is ill adapted to motor traffic, unfortunately, and the roads throughout Rhode Island are poor save on the main tourist routes. In the city proper, over three-quarters the street mileage, or 191.41 miles, is of crushed stone. Of the remaining 61.8 miles, 38.6 is of granite block; 7.91 miles is sheet asphalt; 7.42 miles is bitulithic; 4.11 is cobblestones and the remaining 2.65 is made up of wood block, brick and vulcanite.

FORD'S truck, which has been a matter of the greatest interest to the motor truck industry for the past year, is soon to make its appearance. A number of test models are running about the streets of Detroit at the present time, and as soon as a few of the last details are cleared up and the Ford factory has caught up to the demand for its passenger cars, the truck will be out. As the Ford company is over 100,000 cars behind on its passenger car work, this will probably be in September.

The coming of this truck in great quantities promises to stimulate the light truck field as it has not been affected in the history of commercial vehicles.

Selling at a price which will be close to $500, this vehicle is put within the reach of practically every small merchant in the country. It is a truck which is adaptable to such a wide variety of uses that to attempt to list them would be next to impossible.

May Run on Kerosene

Experiments are being carried on at the present time to determine the possibility of operating this truck on kerosene. These will probably be a success when it is remembered that Holley carbureters are being shipped to Great Britain for installation on the Ford products in Europe. With a truck of this size operating on a fuel costing at from 9 to 15 cents per gallon and probably running a distance of 25 miles to the gallon, the fuel cost should be relatively small.

The experimental trucks are mounted on pneumatic tires in front and solids in the rear, and this will probably be the case when the trucks are put on the market.

The powerplant is similar to that used on the passenger car. It is a four-cylinder block unit, 3¾ x 4 in., with L-head cylinders. This gives a rating of 22.5 hp. by the S. A. E. formula. It is possible that two or three alterations will be made in the castings for the Ford engine at about the same time the truck gets into production. These will probably be related to the cylinder-head casting, permitting better water circulation in the head and better cooling around the spark plugs. Cooling is by thermo-syphon. It is expected that the trucks will be governed to a speed of about 18 m.p.h., although this is subject to variation, as some of the experimental trucks at present running about the streets of Detroit are not equipped with governors.

Worm-driven Axle

The gearset is the same planetary unit as used on the passenger car, the drive being taken from this through a propeller shaft to a worm-driven rear axle, in which the worm is mounted over the gear in the usual manner. The gear reduction at the worm is approximately 7 to 1, being about twice the ratio used in the passenger car. The truck is particularly noticeable for its pressed metal parts and forgings. The wheels are of the artillery type and the gasoline tank is carried beneath the driver's seat.

Electric lighting will be used on the truck, and in all probability combination oil and electric lamps will be supplied as regular equipment, as shown by the accompanying illustration.

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Better Truck Maintenance and Repair

Ideas Worth Money

BRAKES of all trucks must be relined from time to time and carbon deposits are formed in all engines. The two sketches given on this and the opposite page show respectively a simple adjunct to aid in fitting new brake bands and the necessity of removing carbon deposits from the valve stems to prevent motor trouble.

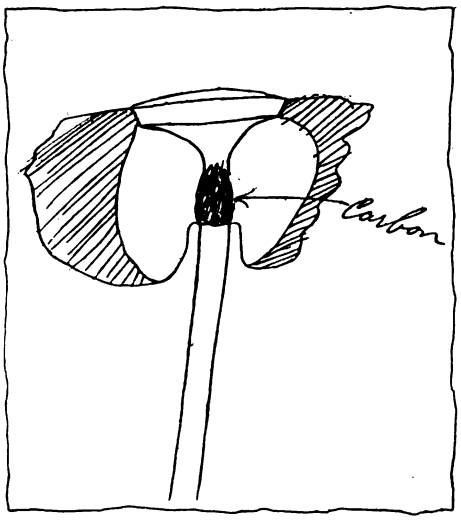
In the latter case, Fred I. Somers, who has charge of a fleet of seventeen trucks for the Fairmont Creamery Co., Omaha, Neb., is of the opinion that carbon on the valve stems causes more trouble than the carbureter, magneto or spark plugs. He believes it good practice to remove the valves every 3 or 4 months and polish the valves and stems even though the engine be running properly. Most people do not generally look for carbon on the valve stems, yet Somers advises that all mechanics be sure that there is no carbon on the stems before condemning a carbureter or magneto.

Similarly, T. D. Price, formerly an operator of trucks in New York City, has found the use of a short length of iron, bent over as shown in the sketch on the opposite page, of great utility in relining brakes on a vise at the side of a workbench. A piece of tool steel inserted in the bent member serves as a good backer for setting the copper rivets.

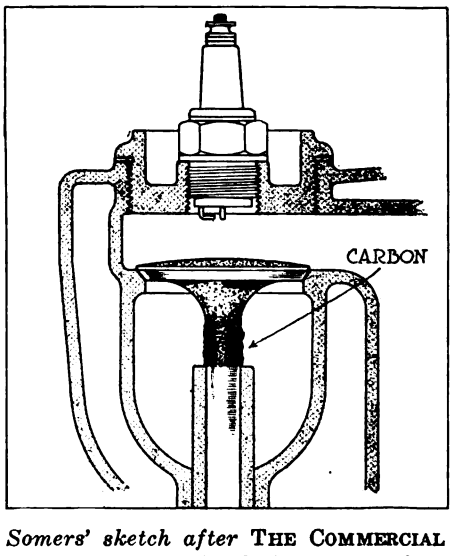
The bent member should be rounded off on the edges of the horizontal portion in order to accommodate the curvature of the brake band. The vertical portion should be left square-sided in order that the vise may grip it and hold it securely. The piece of tool steel can be removed if one of larger size is required for rivets with larger heads.

Somers Says to Keep Carbon Off Valve Stems

1—Always look for carbon on valve stems.
2—Clean valve stems every 3 or 4 months.
3—Don't blame carbureter too soon.
4—Clean stems even if engine is working well.



Somers' rough pencil sketch made for THE COMMERCIAL VEHICLE



Somers' sketch after THE COMMERCIAL VEHICLE'S *artist had redrawn it*

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Where to Look for Carbon and How to Reline Brakes

THE two illustrations on these two pages are the expressions of two ideas which readers of THE COMMERCIAL VEHICLE have found of merit. Try them out in your own truck organization. They should save you money, for anything which helps in keeping an engine running without difficulty and saves time in making repairs means a lesser cost of operation and correspondingly greater profits.

There are thousands of other short and better methods of repairing or maintaining the various units of which the modern motor truck is made up. THE COMMERCIAL VEHICLE wants your ideas. It will pay a minimum of $1 for each new idea which it accepts on better truck maintenance or good truck repair jobs you have made. Simply send us rough sketches like those which Somers and Price mailed to us and a short letter telling your idea in brief and the various methods you used to work it out.

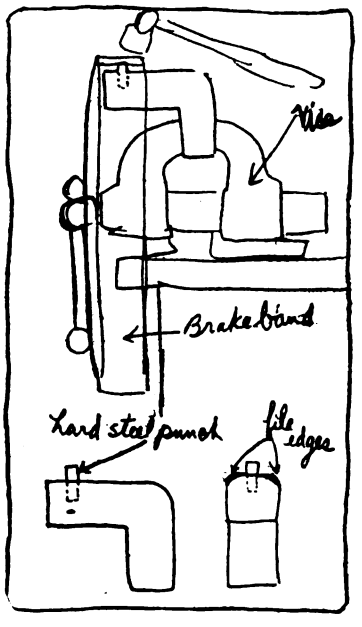
There is nothing difficult in this. It matters not if you are not a subscriber. All truck owners are eligible and all have at some time or another been put to the test of making some ordinary or unusual repair which experience has taught them can be made in a better and quicker manner.

It does not matter whether your trouble has been with a radiator, engine, clutch, gearset, springs or brakes or any other of the numerous parts of which the up-to-date commercial vehicle is composed.

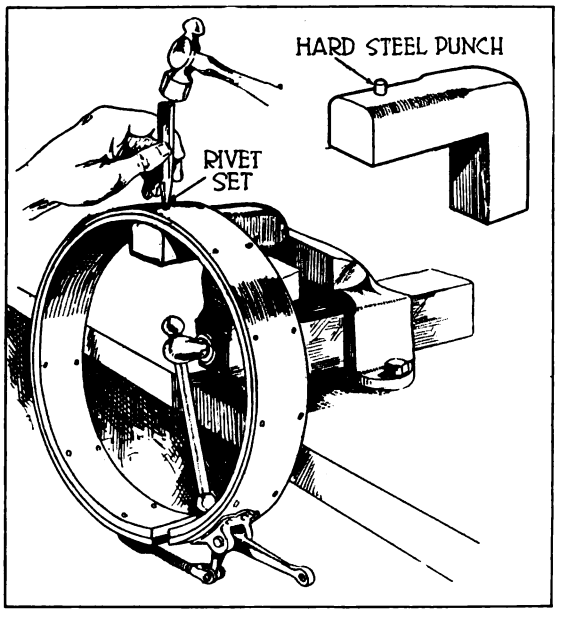
Send in your ideas. The more that are sent in the more will you benefit because of the greater number of ideas published. This department is a common ground where owners and operators may interchange their ideas with mutual benefit.

An Easy Way to Reline Brakes

1—Bend vise piece as shown below.
2—Fit hard steel punch.
3—Round off corners for brake curvature.
4—Rivet set and hammer complete tools.



The rough sketch which Price sent in, showing his idea



Price's idea as expressed by THE COMMERCIAL VEHICLE'S *artist*

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The Readers' Forum

Devoted to topics pertinent to commercial vehicle operation design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

MAKERS OF CRANES FOR TRUCKS

User Wants Loading Means for 10-ton Truck with High Body

To the Editor, COMMERCIAL VEHICLE:

We have a 10-ton Mack truck with a high body which requires considerable work in loading. Will you please give us the names and addresses of manufacturers of light cranes built for attachment to trucks for hoisting merchandise of a heavy character into the body? —C. L. N., Holyoke, Mass.

To the best knowledge of THE COMMERCIAL VEHICLE there is no one concern which specializes on cranes of the type you desire, although no doubt some of the concerns given in the following list can furnish you with a special apparatus to meet your particular needs:

Alben Co., Milwaukee, Wis.
Boston & Lockport Block Co., Boston, Mass.
Brown Hoisting Machinery Co., Cleveland, Ohio.
Cameron Engineering Co., Washington, N. J.
Canton Foundry & Machine Co., Canton, Ohio.
Chisholm-Moore Mfg. Co., Cleveland, Ohio.
Ford Chain Block & Mfg. Co., Philadelphia, Pa.
Franklin Portable Crane & Hoist Co., Franklin, Pa.
Giant Cable Hoist Co., Cleveland, Ohio.
Edwin Harrington Son & Co., Philadelphia, Pa.
Ingersoll-Rand Co., New York City.
Lafayette Eng. Co., Lafayette, Ind.
S. G. Milton & Son, Franklin, Pa.
Franklin Moore Co., Winsted, Conn.
New Jersey Foundry & Machine Co., New York, N. Y.
Niles-Bement-Pond Co., New York, N. Y.
Portable Tool Co., Monroeton, Pa.
D. Round & Son, Cleveland, Ohio.
J. G. Speidel, Reading, Pa.
Frank Porter Stone, Chicago, Ill.
Frank Toepper's Sons, Milwaukee, Wis.
U. S. Auto Bumper Co., Chicago, Ill.
Union Elevator & Machine Co., Chicago, Ill
United Engine & Mfg. Co., Hanover, Pa.
Wright Mfg. Co., Lisbon, Ohio.
Yale & Towne Mfg. Co., 9 East 40th Street, New York City.

DATA ON OVERLAND HAULS

Questions Feasibility of Trailer Use on 110-mile Trip

To the Editor, COMMERCIAL VEHICLE:

Owing to the deplorable condition of the railroad facilities between New York and Hartford, Conn., and realizing that there is no apparent immediate relief from the congestion which has inconvenienced the merchants of Hartford, and to some extent those of New York, it is my idea that a motor truck line running between the two cities on a regular schedule would alleviate the present poor conditions.

Will you please give me your opinion as to the advisability of this proposition, as you are in a better position to understand the requirements of continually running trucks a great distance and always loaded to capacity.

Would a 5-ton truck of high quality and a 5-ton trailer be capable of making the distance between Hartford and New York in 12 hours? The distance is approximately 110 miles. Would the weight of the trailer and the load have much effect on the truck itself when encountering a steep grade?—A. S. H., Hartford, Conn.

In the opinion of THE COMMERCIAL VEHICLE it is not feasible to attempt to run a 5-ton truck and 5-ton trailer between New York and Hartford within 12 hours. To cover the distance of 110 miles in 12 hours would mean an average running speed of 9.1 miles per hour. Due to the grades on the route and the none too good condition of some of the roads, a 5-ton truck alone would make a good record day in and day out if it covered this distance in the 12-hour period.

With loads in both directions it is our opinion that a 5-ton truck working as a unit without any trailer would make a paying proposition, especially due to the higher ton rates which could be secured because of the great amount of time that could be saved in deliveries due to the elimination of hauls at both ends of the route.

The attempt to use a fully-loaded 5-ton trailer behind a truck of the same capacity would reduce the speed considerably, especially when negotiating the grades that would be encountered on the New York to Hartford route. It is entirely possible that this reduction in speed would more than offset the value of the added carrying capacity. In the early part of 1916 a motor haulage contractor in New York City transported a large shipment of steel from New York to Hartford and used trailers behind several of the trucks. Both trailers and trucks were fully loaded, and at some points on the route it was necessary to use two trucks, coupled together, in order to get the trailers, one at a time, over some of the steep hills encountered. The opinion of the haulage contractor mentioned is that better results could be obtained by running fully-loaded trucks by themselves rather than in connection with trailers.

1916 TRUCK PRODUCTION FIGURES

Total Production and Number of 1-, 1½- and 2-tonners Built

To the Editor, COMMERCIAL VEHICLE:

Will you please furnish us with statistics covering the number of commercial vehicles made during 1916, dividing these into the numbers of the various capacities, but more particularly 1-, 1½- and 2-ton sizes.—E. S. MILLS, vice-president Muncie Wheel Co., Muncie, Ind.

As reported in THE COMMERCIAL VEHICLE of Jan. 1, 1917, the 1916 production of motor trucks totalled 98,000.

Of this number, approximately 24,500 were of 1-, 1½- and 2-ton sizes.

This smaller total may be further subdivided into the approximate number of each of the three sizes included as follows: 40 per cent for each of the 1- and 1½-ton sizes and 20 per cent for the 2-ton size. This gives 9800 1-ton trucks, 9800 1½-ton trucks and 4900 2-ton trucks. These figures are not accurate production figures but are estimates based on our knowledge of the industry and tempered with good judgment.

NAME OF ROPE TIRE MAKER

Desires Photograph of Novel Rope Tire Successfully Used in Australia

To the Editor, COMMERCIAL VEHICLE:

We received some time ago a clipping from our Boston branch, which appeared in the *Boston Record*, under the title "New Rope Tire Makes Big Hit in Australia." We have written several publications asking them if they could advise us as to where we should be able to obtain a photograph of that particular type of tire. We are advised by the *Popular Science Monthly* to address THE COMMERCIAL VEHICLE on the subject, and accordingly we request if you can supply us with such a photograph or can tell us where it may be obtained. —A. R. B., Akron, Ohio.

We do not have a photograph of the rope tire used in Australia, but would suggest that you communicate with Edward E. Pratt, Chief of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C., who no doubt can supply you with such a photograph or obtain one for you through one of the consular or commercial attachés under the supervision of his department.

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1916 AND 1917 TRUCK PRODUCTION

Number of Trucks in Use and Average Prices of Various Sizes

To the Editor, COMMERCIAL VEHICLE:

Will you please give me the answers to the following questions:

1—The total number of motor trucks in actual operation in the United States on Jan. 1, 1917. Include if possible the number of trucks of each capacity, for instance: the total number of light delivery trucks, 2-ton trucks, 3-ton trucks, etc.

2—The number of different kinds of trucks that will probably be made and sold in 1917.

3—The average price to the consumer of the various sizes of motor trucks, including a fair estimate on the average price of the body.

4—Please show separate figures for the gasoline and electric trucks included in the above.—A. B. P., New York City.

Answers to the above questions in the order given are as follows:

1—The total estimated number of motor trucks in actual operation in the United States on Jan. 1, 1917, is 198,000, as reported in the Jan. 1, 1917, issue of THE COMMERCIAL VEHICLE. This figure includes both gasoline and electric trucks. There is no definite information readily available as to the number of the various capacities in use, although it is a fair assumption that approximately half of the total of 198,000 are of 1500-lb. capacity and under.

2—The estimated production of motor trucks for 1917 is 200,000. These will be manufactured by approximately 250 makers. Of course, war conditions are liable to affect this estimate which was published in the Jan. 1, 1917, issue of THE COMMERCIAL VEHICLE.

3—The average prices to the consumer of the various sizes of motor truck chassis are as follows:

Less than ½-ton	$503.33
½-ton	760.59
¾-ton	1,217.73
1-ton	1,521.50
1½-ton	1,950.34
2-ton	2,302.91
2½-ton	2,526.60
3-ton	3,356.21
3½-ton	3,258.33
4-ton	3,488.63
5 and 5½-ton	4,181.08
6 and 6½-ton	4,725.00
7 and over	4,825.00
Tractors	3,862.50

The above figures are for the chassis only, the cost of bodies varying anywhere from $75 to $200 or more, depending upon the elaborateness and finish of the job.

4—The estimated number of electric trucks included in the 198,000 total given in answer to No. 1 is between 10,000 and 15,000. This gives the total number of gasoline trucks in use on Jan. 1, 1917, as somewhere between 183,000 and 188,000.

According to figures prepared by William P. Kennedy for the National Electric Light Assn., and published in THE COMMERCIAL VEHICLE of April 1, 1917, there are approximately 5801 electric trucks in use in ten large cities throughout the United States, as follows:

New York City	2,800
Chicago	1,050
Philadelphia	510
Boston	314
Newark, N. J.	331
Washington, D. C.	250
Baltimore	140
Detroit	175
Cleveland	115
St. Louis	116
Total	5,801

DETAILS AFFECTING TIRE SERVICE

Reader Desires Influence of Treads, Wheelbase and Load Heights

To the Editor, COMMERCIAL VEHICLE:

Do any previous issues of THE COMMERCIAL VEHICLE give any information on truck construction, relating especially to tread widths, wheelbase, heights of load, etc., and the influence of these details on tire service?—W. C. H., Akron, Ohio.

THE COMMERCIAL VEHICLE has published no comprehensive article showing the influence of tread widths, wheelbase and heights of loads on truck tire service.

Each of the details has been treated separately, however, on various occasions. For instance, the necessity for standard motor truck tread and the influence of a standard tread on tire service is treated briefly in H. D. Church's paper on the requirements of the United States war trucks as determined by our experience in Mexico, published on pages 17 to 19 in this issue.

The wheelbases of the various makes and types of trucks on the American market were published in full in the November 1, 1916, issue of THE COMMERCIAL VEHICLE.

Heights of loads are somewhat dependent upon the heights of the load platforms of trucks above the ground, as pointed out on page 30 of the February 1, 1917, issue of THE COMMERCIAL VEHICLE. The average floor height for motor trucks is now approximately 42 inches, eliminating the lighter capacities, which usually have their bodies set between the wheels and therefore lower. It is only in recent years that this standard has been approximated in trucks, although it was a standard in horse wagons for a much longer period. The reason that such a standard was not approximated sooner was due to the great variety of former motor truck construction.

It is generally conceded that topheaviness of a load has a deleterious effect upon the tires, especially if the tread is narrow. This is because the pressure of the load exerts a side instead of a direct thrust on the tires when the roads are uneven and the frame of the truck tilts over to either side. Of course, this action is greater in reverse proportion to the tread, or increases as the tread decreases. The effect of the wheelbase is not considered as of equal moment to the tread.

THREE-WHEELED TRACTORS

Reader Desires Makes of Three-wheeled Road Tractors Now in Service

To the Editor, COMMERCIAL VEHICLE:

Will you please advise if there are any three-wheeled motor tractors now in use? If so, will you please advise when each first appeared and give a short description of each model or make?—J. D., Richmond, Va.

Perhaps the most famous of the three-wheeled motor tractors on the American market was the Knox tractor made by the Knox Motor Car Co. in Springfield, Mass. That tractor was brought out during the latter part of 1909 and the beginning of 1910, and was used for heavy haulage work throughout the United States until the latter part of 1914, when a new model of tractor with four wheels superseded it. The old Knox model had a single wheel in front for steering and was featured by a special set of springs entirely independent of the rest of the tractor and supported the two-wheeled semi-trailer usually used direct from the axle. The tractor had its own rear springs, which took none of the trailer load, these being of the cantilever type. This special mounting has been continued in the new four-wheeled tractor, sold by the Knox Motors Associates, Springfield, Mass.

The Mercury Mfg. Co. of Chicago also makes a small three-wheeled gasoline-driven tractor which was originally developed for use in handling long strings of self-tracking trailers carrying manure in the Chicago stockyards. The Mercury company also manufactures small electric tractors of the three-wheeled type used for baggage handling and for transferring material between the various buildings of large manufacturing plants. The latter vehicles are not road tractors in the true sense of the word.

TRUCK EXPORTS DURING THE WAR

Editor Desires Number and Value Sent Abroad Since August, 1914

To the Editor, COMMERCIAL VEHICLE:

Will you please advise me how many motor trucks have been shipped abroad since the beginning of the war in August, 1914? Will you please give the value of these exports and also, if possible, segregate them according to yearly periods, such as from August, 1914, to December, 1914, during 1915, during 1916 and during the elapsed months of 1917?—MR. FOSS, *Railway Age Gazette*, New York City.

Since August, 1914, up to and including February, 1917, a grand total of 46,590 commercial vehicles, valued at $126,904,401, were shipped abroad. By years these may be segregated as follows:

	Number	Value
1914 August to December	2,981	$8,337,515
1915 January to December	22,582	60,052,246
1916 January to December	18,903	52,870,774
1917 January to February	2,124	5,643,875
	46,590	$126,904,410

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Accessories for the Truck

Service Records Given by Hamilton Multometer

THIRTEEN distinct service records of motor vehicle operation can be obtained from the Hamilton Multometer, made by the Hamilton Corp., Lancaster, Pa. The device was originally designed for both passenger car and motor truck use. It is suggested that it be driven off the propeller shaft aft of the gearset when used on a truck instead of off the front wheel, as is usually the case when it is attached to passenger cars. This change is beneficial because of the great vibration of the front wheels of trucks on solid tires as compared with passenger vehicles on pneumatics, and which is lessened if the device is driven off the driveshaft.

The device is somewhat similar in appearance to the ordinary speedometer, which it incorporates, and is mounted on the dashboard in a conventional manner. In mechanism it consists of thirteen odometers, operated in sequence by a series of spring pawls, one flexible cable serving to give readings on all of the odometers. The readings which may be had on the device include: Car speed, trip mileage, total mileage, individual tire mileage for each of the four tires used on the truck and for two spare tires, gasoline consumption, oil consumption and warnings at the end of every 500 and 1000 miles, at which times certain adjustments of various parts are necessary.

The thirteen odometers are nested together in two groups on parallel shafts, and the whole inclosed in a casing with a slotted dial, a movable ring around the dial and two adjustment knobs. As shown in Fig. 5, the dial ring has twelve divisions around its circumference, one for each of the recorders, each marked with its corresponding title. In getting any one of the desired records, the dial is first turned so that the wording on the ring for that particular record is opposite the slot cut in the dial face. To engage or disengage any particular odometer, do the same as in getting a reading, and then use inside knob. The outside knob is for resetting. This record automatically shows through the slots in the dial face, as indicated in the illustration, Fig. 5. Any one of the thirteen odometers may be turned to view behind the slot in the dial at will, although only one odometer reading may be had at a time.

If, for instance, it is desired to determine the mileage of tire No. 3, the ring is moved around until the words, Tire No. 3, are opposite the slot in the dial face. The mileage record of tire No. 3 is then automatically determined and placed so as to appear through the slot. Similarly, if tire No. 3 were removed at 3000 miles and spare tire No. 5 fitted in its stead, the latter's odometer would be set at 0. Then if tire No. 5 ran 1000 miles before removal, the records of tires Nos. 1, 2 and 4 would show 1000 plus 3000 miles, provided they were put on at the same time as tire No. 3.

The gasoline and oil consumption records differ from the others secured in that the former are manual and the latter mechanical. All tire mileage records, speed and vehicle mileages are automatically obtained through the single flexible shaft drive of the device, while the gasoline and oil records are obtained by setting the odometers by hand each time either gasoline or oil is added. The odometer readings give the total of each used, and by dividing the total mileage by the total gasoline or oil used, it is possible to calculate the miles per gallon in each case.

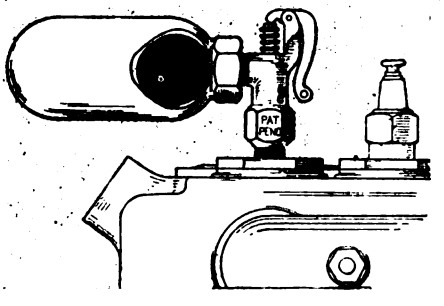


Fig. 2—The Buell explosion whistle as screwed in cylinder head in place of priming cup

The speedometer used in the instrument is of the centrifugal type, as shown in Fig. 5, which also illustrates the outward appearance of the device and shows the manner in which the different odometers are nested.

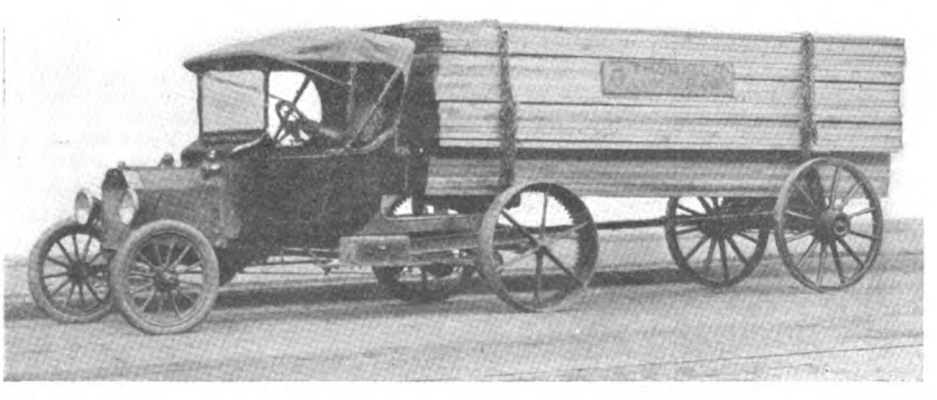


Fig. 1—The Staude Mak-A-Tractor adapter for Fords hauling lumber in commercial service. The attachment may be put on or taken off in 20 minutes

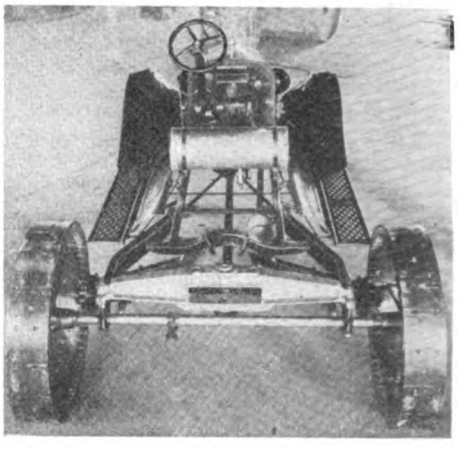


Fig. 3—Rear view of the Staude Mak-A-Tractor, showing frame, internal-gear drive and hole for fifth-wheel kingbolt

Buell Explosion Whistle for Truck Engines

OPERATED by the explosion of the cylinder gases, the Buell explosion whistle, made by the Buell Mfg. Co., Chicago, consists of a plug screwed into the cylinder in place of the priming cup, a wire operated valve to allow the explosion gases to escape and a sounding bell to vibrate the gases to give a penetrating sound. On engines not furnished with priming cups, such as that of the Ford, a special spark plug with an opening on the side to accommodate the whistle is provided.

The plug screwed into the cylinder has a hexagonal-shaped portion at the bottom for screwing into place, and is provided with a short arm at the top, which acts as a pivot for the lever by means of which the opening valve inside the plug is manipulated. The valve stem extends out through the top of the plug, and is kept against its seat by a coil spring outside of the plug. The valve seats below the elbow opening of the plug at the top to which the whistle sounding bell is attached. The latter is cylindrical in shape, with a domed end and an egg-shaped opening at the end nearest the plug.

In operation, the valve is opened by a string or wire attached to the lower end of the pivoted lever and carried to a position convenient to the driver's hand. When pulled, it allows the gas from the cylinder to shoot out under the pressure of the explosion through a narrow slot into the sounding bell, where it is made to vibrate before passing back and out of the egg-shaped opening, which has narrow knife-like edges. The pressure of the explosion gas, which varies from 250 to 300 lb. per sq. in., is sufficiently high so that a small volume will make a considerable noise.

The whistle slot is 30/1000 in. wide and ½ in. long. This restricted area does not permit sufficient of the cylinder gases of explosion to escape to make a serious reduction in the power produced by the cylinder on which the whistle is installed. The other cylinders of the engine are, of course, working at full efficiency, so that only a fraction of the total output of the engine is used at the time of blowing the whistle, not enough to affect the power, even on a long pull up a grade. The whistle is shown in Fig. 2.

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Rhamstine Kerosene Adapter Is New

A NEW system of kerosene carburetion just put on the market for motor trucks is the Rhamstine. This new product is not strictly a carbureter but rather an adapter. These kerosene adapters are now being manufactured in Detroit, while the offices of the Rhamstine Kerosene Adapter Corp. are in Washington, D. C., where the invention was developed.

The adapter part of the unit system is clearly shown in the accompanying illustration, and the two standard Schebler carbureters, one for starting on gasoline, the other for running on kerosene, are shown air brushed. These standard carbureters are included as parts of the complete Rhamstine unit.

In the design of the Rhamstine adapter it was realized that it is practically impossible to start a cold motor through a cold carbureter on kerosene and that, from a viewpoint of cost, it was not desirable or commercially practical to heat the kerosene fuel to such a temperature by electricity that it could be ignited and the motor started. Accordingly, a valve was devised which admits of a selective fuel control. In other words, the motor is started on a minute quantity of gasoline, which is immediately shut off by the valve while the motor passes to kerosene without the least perception of a change. The fuel supply is controlled from the driver's wheel.

By means of the exhaust, the fuel is heated to an average of 135 deg. Fahr. before it enters the standard carbureter. In a like manner the air is heated to an average of 175 deg. Fahr. before it enters the carbureter. From the carbureter the mixture passes into the adapter, where it is attenuated, dried and broken up. The mixture is then in condition for explosion.

A 3-ton brewery truck operated in Minneapolis has just finished a 5 weeks' test in service of the adapter. It is stated that not an hour's work was missed by the truck and the use of kerosene made its operation for the test period just 55 per cent lower in fuel cost. In Washington there are several trucks equipped with Rhamstine adapters. These are the only instances where the manufacturer has endeavored to put the adapter into actual service up to date.

The maker claims that both shop and service tests have brought out the fact that the adapter enables the truck driver to change from gasoline to kerosene by means of the fuel control without a falter showing up in the engine. Also that in the shop 94 per cent of the total number of runs made showed an excellent condition of the exhaust, and at no time was the exhaust rich. The shop tests also showed that the adapter handles the change in average motor truck speeds—5 miles to 20 miles per hour, or in revolutions per minute 400 to 1600—with desirable flexibility.

The following results of shop tests run with a 30-hp. four-cylinder truck engine show conclusively the extreme economy of fuel consumption with kerosene:

GASOLINE		KEROSENE	
R.P.M.	Lb. Fuel Per B.H.P. Hr.	R.P.M.	Lb. Fuel Per B.H.P. Hr.
600	1.10	600	0.65
700	1.05	700	0.65
800	1.05	800	0.68
900	1.07	900	0.70
1000	1.10	1000	0.75
1100	1.20	1100	0.90
1200	1.30	1200	1.12

Shop tests on the same engine with the adapter showed that at speeds of from 800 r.p.m. to 1200 r.p.m., gasoline developed slightly more brake horse power than kerosene. Kerosene, however, from speeds of 500 to 800 r.p.m. showed up slightly better than the gasoline, so that the brake horse power developed by the two fuels nearly averaged, with a slight balance in favor of the gasoline.

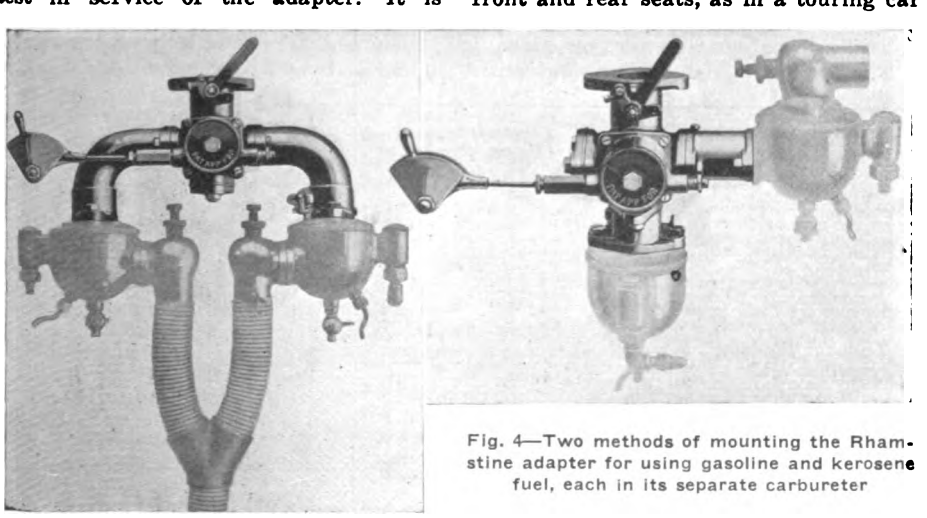


Fig. 4—Two methods of mounting the Rhamstine adapter for using gasoline and kerosene fuel, each in its separate carbureter

Staude Mak-A-Tractor for Fords

ATTACHABLE or detachable in 20 minutes, the Staude Mark-A-Tractor, built by the E. G. Staude Mfg. Co., St. Paul, Minn., is designed to convert a Ford car into a tractor for farm use or for commercial service in connection with a two-wheeled semi-trailer. The apparatus consists of a channel-iron frame which is clamped to the Ford frame at a point midway between the front and rear seats, as in a touring car

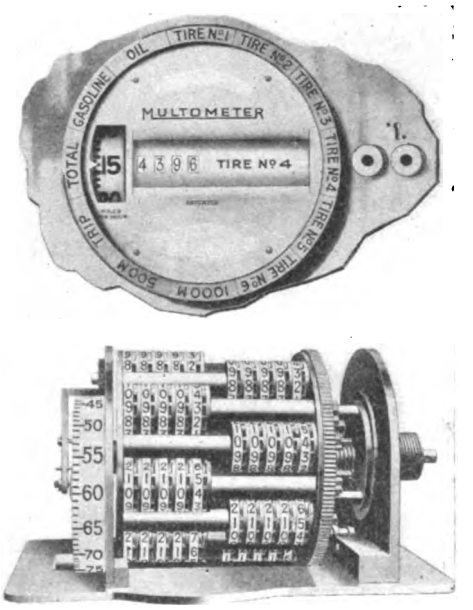


Fig. 5—The Hamilton Multometer, which gives thirteen different service readings on the one instrument

model, and which is secured to the Ford axle by two wide brackets. The rear wheels of the Ford are removed and replaced by small pinions integral with new break drums. These mesh with large internal-gear rings on the inner circumferences of the wide-tired steel wheels furnished as part of the outfit. An extra large radiator of the same shape as that usually fitted on the Ford is supplied to provide sufficient cooling surface at the slower speeds at which the tractor runs. A positive forced-feed lubrication system is also fitted instead of the splash type on conventional Fords.

After the radiator, oiling system and frame are installed, all that is necessary to change the Ford from a passenger car to a tractor for farm work or for hauling a semi-trailer is to take off the Ford rear wheels and break drums, replacing them by the driving pinions, and add the tractor axle and wheels. The channel frame of the tractor device may be left permanently attached to the Ford frame. It does not affect the riding capabilities of the Ford as a passenger car to any great extent nor is it unsightly.

The rear cross member of the attachment frame is of I-beam section, and is provided with a vertical hole through the center, which serves to take the kingbolt of a fifth-wheel device should the adapted vehicle be used to support the front end of a semi-trailer.

The tractor wheels, as shown in Fig. 3, are 38 in. in diameter, with 8½-in. faces. They are made of semi-steel cast in one piece, and have the internal gear rings bolted to them on the inside circumferences of the tires. When the vehicle is to be used in cross-country work or on sandy roads, short, concave creepers are provided, to be bolted through the tire treads. The tractor axle is of round stock of 2 in. diameter and is placed slightly aft of the Ford axle, so that the wheelbase of the adapted vehicle is slightly longer than that of the usual Ford. The driving pinions come in various sizes to give different speeds, according to the running conditions under which the vehicle may have to operate. The usual speed with a semi-trailer is about 5 m.p.h.

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The 3½-ton Acason special, showing trussed frame and 5-ton tire equipment

Acason Adds Three New Models—One a Special 3½-Ton Unit

SINCE November last, when specifications of all principal American trucks were published by THE COMMERCIAL VEHICLE, the Acason Motor Truck Co., Detroit, has made several changes in its line. In addition to its 2- and 3½-ton vehicles, it has produced a 1½-tonner, a 3½-ton special model and a 5-tonner. All three new models follow the general lines of their predecessors except the 3½-ton Special, which is a new departure in truck design.

This vehicle is practically the same as the 3½-tonner, except that it has stronger springs, a trussed frame and 5-ton tire equipment. It is not intended for 5-ton loads, however, but for loads not to exceed 4 tons and an average load of 3½ tons. The reason for its extra strength is to provide ruggedness for the exceptional rigors of service with brick concerns and machinery handlers, whose loads are full loads nearly all the time and who are obliged constantly to traverse rough ground in delivering their products to the scene of building operations.

On all Acason trucks the Waukesha engines are located beneath conventional hoods with the gearsets incorporated with them, the unit powerplants thus formed being invariably suspended directly from the frame. On the smaller models block-cast cylinders are used, but the 3½-ton, 3½-ton Special and 5-ton models have pair-cast cylinders. Valves on the block-cast engines are to the right and to the left on the pair-cast ones.

Centrifugal pump circulation is relied upon in cooling in all models, all radiators having built-up cast iron casings. Finned vertical-tubular cores are used on the smaller jobs and the zigzag-tube type on the larger.

Stromberg carbureters are applied to the 1½- and 3½-tonners, but the 3½-ton models have Scheblers. Vacuum fuel feed from tanks beneath the seats is used on all types. Governors of Waukesha make are applied, these being of the centrifugal type driven from the engines.

Eisemann single magneto ignition with hand spark advance is employed.

Borg & Beck dry-plate clutches are employed on the large and small models and dry-multiple-disk types on the two 3½-tonners. All models have three-speed selective gearsets except the 3½-ton Special, which has four speeds with direct drive on fourth.

The rear axles are worm-driven Timkens in each case, these having the Timken duplex brake, of course, and Hotchkiss drive.

Acason frames are of pressed steel with integral front spring-horns and are semi-flexible in construction. The 3½-ton Special model is trussed somewhat like a freight car. There are steel struts riveted to the middle of the frame on each side, over which the rods are stretched and brought under tension by turnbuckles. This relieves the weakest portion of the frame from excessive strain, as when heavy machinery is loaded at the front end of the body or when a dumping body is allowed to descend too swiftly, making the front and rear portions of the frame share the shock.

All Acason models have right steer and central levers. Hayes wood wheels are regularly fitted to all models, but upon order Smith hollow cast steel wheels will be fitted to the 5-tonner.

ACASON SPECIFICATIONS

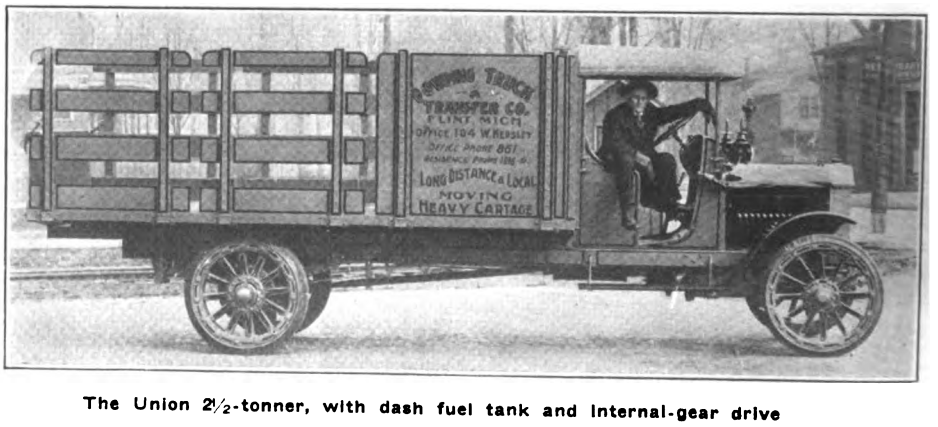
Capacity, lb. ..	3000	7000	10,000
Price	$150	$166	$172–$166
Wheelbase, in..	34x3½	34x5	36x6
Tires, front....	34x3½	34x5	36x6
rear	36x5	36x6	40x6
Bore, in.....	3½	4¼	4¾
Stroke, in.....	5¼	5¾	6¾
N. A. C. C. hp..	19.61	29	36.15
Speed, r.p.m....	1500	1100	900
m.p.h.	18	13	11
Gear-ratio in high gear.....	8¾–1	9–1	9¾–1
Final drive.....,	worm	worm	worm

Union 2½-Ton Truck Has a Steel Dash and Cowl Fuel Tank

WITH a steel dash and cowl fuel tank, the Union truck, made by the Union Motor Truck Co., Bay City, Mich., is offered in one model of 2½ tons capacity and follows conventional truck design. It is assembled from standard units for the most part and is provided with a Russel internal-gear-driven rear axle.

The engine, of Wisconsin manufacture and located under a conventional hood forward of the dash, is mounted in a unit powerplant consisting of a Fuller multiple-disk clutch of the wet type and a Fuller selective three-speed gearset. The engine cylinders are cast in block with the valves located at the left.

The engine cooling is by a centrifugal pump driven off the magneto shaft on the



The Union 2½-tonner, with dash fuel tank and internal-gear drive

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UNION SPECIFICATIONS

Capacity, lbs.	5,000
Price	$1,875*
Wheelbase, in.	152
Tires, front	39 x 4
rear	39 x 6
Bore, in.	4
Stroke, in.	6
N. A. C. C., hp	25.60
Speed, r.p.m.	
m.p.h.	
Gear-ratio in high gear	7.75—1
Final drive	Int-gear

*With cab top and seat.

right side of the motor. The radiator, which is of the vertical finned-tube type, has side columns made of steel and top and bottom tanks of aluminum, the former with fins for greater heat radiation. It is mounted on the frame on trunnion blocks on the steel side members, which carry no water.

Fuel is fed to the Schebler carbureter by gravity from a 17-gal. tank made of welded steel and held in place on the left side of the cowl by means of bands hinged to the top of the cowl and two small brackets at the bottom to which the bands are bolted. Should the tank ever leak, only four bolts through the bands and brackets need be removed in order to take it off, and without dismantling the truck.

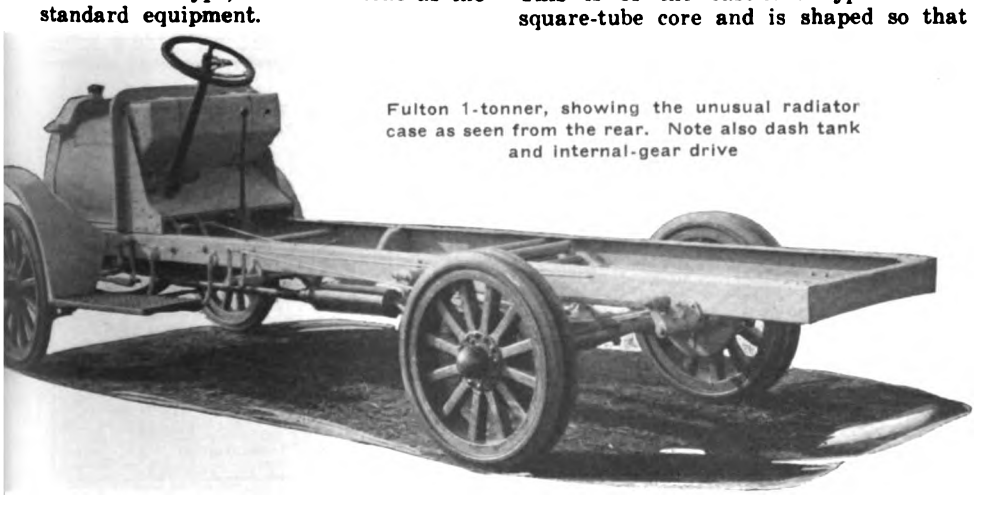
No governor is fitted. Ignition is on the single system, employing an Eisemann high-tension magneto. No electric starting or lighting equipment is furnished as standard.

From the gearset, the drive is taken by a long shaft with two universals to the Russel internal-gear-driven axle. The axle is arranged on the Hotchkiss plan so that the springs take both the torque and propelling stresses.

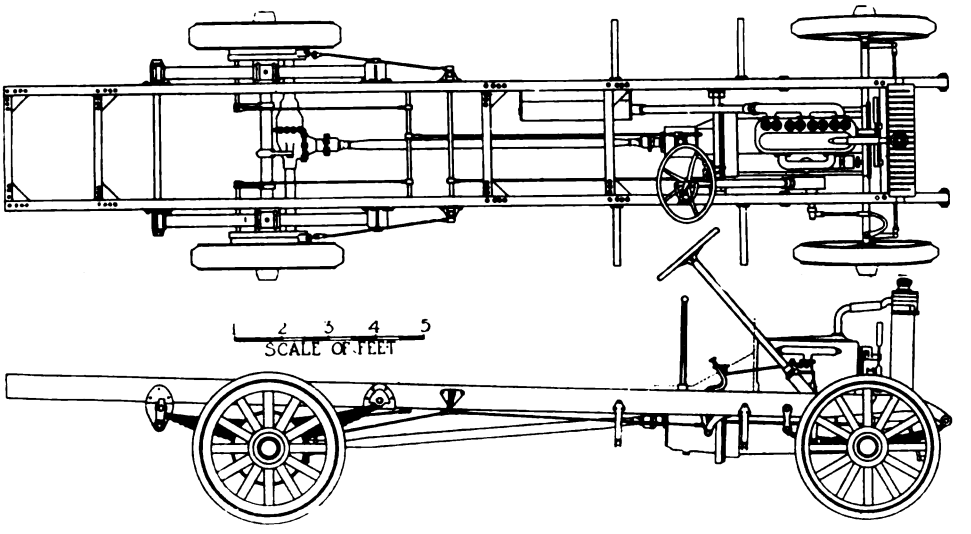
The brakes, of the internal and external types, are both located on the rear wheels, the former being operated by hand and the latter by foot.

The frame is made of pressed steel and is of the semi-flexible type with four cross-members, two near the rear and two aft of the gearset location and in front of the front ends of the rear springs. The frame is 240 in. long and is made of ¼-in. stock with a 6-in depth.

The wheels are of the artillery type, all with twelve spokes, those in the front being 2 in. square and those in the rear 2½ in. square. All the tires are of the demountable type, with Firestone as the standard equipment.



Fulton 1-tonner, showing the unusual radiator case as seen from the rear. Note also dash tank and internal-gear drive



Plan and chassis views of the Union 2½-tonner, showing construction details

Right steer and center control are employed. The steering gear is of Ross make of the block-and-worm type.

The cowl is of 14-gage steel, quite high in front to afford protection for the driver and for mounting the bolster-shaped tank. Similarly the driver's seat is of 14-gage pressed steel, with a large compartment underneath for jack, tools, blocks, etc.

Fulton 1-Tonner Has Unusual Radiator and Small Dual Rear Tires

DISTINGUISHABLE by its novel, partially round-shaped radiator and by small dual tires in the rear, the Fulton truck is offered in one model of 2000 pounds capacity. It is made in Farmingdale, L. I., by the Fulton Motor Truck Co., and was formerly known as the Clyde, made by the Clyde Motor Truck Co., before the latter was reorganized into the Fulton concern. It has a unit powerplant, dash fuel tank and final drive by internal gears.

The engine, made by Golden, Belknap & Schwartz, is located under a hood forward of the dash. Its cylinders are cast in block with the valves at the left. The crankshaft is mounted on three ball bearings.

Cooling is by the thermo-syphon system, used in connection with the large-sized Fulton radiator of special design. This is of the cast-case type with a square-tube core and is shaped so that the central part is round and slightly wider than the hood. This is for the purpose of increasing the cooling surface and permitting the use of a four-bladed fan 20 in. in diameter.

FULTON SPECIFICATIONS

Capacity, lbs.	2,000
Price	$1,090
Wheelbase, in.	136
Tires, front	34 x 3½
rear	34 x 2½d
Bore, in.	3¾
Stroke, in.	4¼
N. A. C. C., hp	22.50
Speed, r.p.m.	
m.p.h.	
Gear-ratio in high gear	7.5—1
Final drive	Int-gear

The engine is fed by gravity from a rectangular-shaped tank on the dash with a sloping bottom and a capacity of 14 gal. Lubrication is by a combination pump and splash system in which the connecting rods dip into an oil bath in the crankcase. No governor is fitted. Ignition is on the single plan, employing a Splitdorf Dixie high-tension magneto with a set spark advance.

From the engine the drive is taken through a Borg & Beck dry-disk clutch and a three-speed selective gearset mounted in a unit. From aft the gearset the drive is taken by a single shaft with two universals to the Russel internal-gear-driven rear axle, torque and propulsion being taken through the springs. To strengthen the front ends of the rear springs to take both driving and torque, a double spring-pinning system has been used. In this the upper leaf is held by a fixed pin and the second eye by a secondary pin supported by two triangular plates dependent upon the first.

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Beck Re-enters Field With Three New Models



Beck 2-tonner using internal-gear drive

HAILING from Cedar Rapids, Iowa, the Beck truck is a revival of manufacturing by the Beck Motor Truck Works, formerly Beck & Son, who some time ago abandoned truck manufacture to become agents for a Michigan-built line of trucks. The concern has recently reverted to the assembly of its own vehicles and dropped the other truck.

In design, this vehicle is not radical in any particular, and it is sold principally in Omaha, Neb.; Dallas, Tex., and Chicago. Three sizes are built, of 1, 1½ and 2 tons' capacity, all of which are practically identical except in the size and strength of load-supporting members.

Their engines are located under louvred hoods, being of Continental manufacture, block cast, with valves at the right on the two smaller models and pair-cast with valves to the left on the 2-tonner.

Cooling is by centrifugal pump circulation through a cellular radiator in a sheet brass casing on all models, and Stromberg carbureters are fitted. Fuel feed is by gravity from tanks beneath the seats, and all models have Pierce governors driven from the engine. Single Bosch magnetos are applied to these trucks, with fixed spark advance.

Fuller dry-plate clutches, Raybestos-faced and three-speed selective gearsets of the same make are applied to all models and all have final drive through two-part shafts to their Celfor internal-gear-driven rear axles.

BECK SPECIFICATIONS

Capacity, lb.	2000	3000	4000
Price	$1,080	$1,275	$1,700
Wheelbase, in.	124	144	144
Tires, front	34x3	34x3	36x3½
rear	34x3½	34x4	36x5
Bore, in.	3½	3½	4½
Stroke, in.	5	5	5½
N. A. C. C. hp.	19.61	19.61	32.40
Speed, r.p.m.	——	——	——
m.p.h.	18	18	14
Gear-ratio in high gear	——	——	——
Final drive	internal gear		

Manly 1½ and 2½-Tonners Offered With Kerosene-burning Equipment

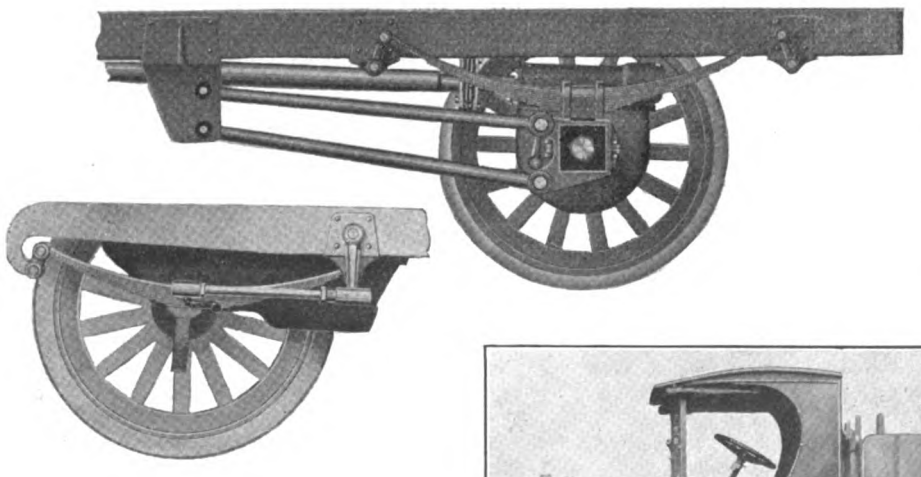
FITTED with kerosene-burning equipment at extra cost, Manly trucks, made by the Manly Motor Corporation, Waukegan, Ill., are offered in two models of 1½- and 2½-ton capacity. Both models follow the same general lines in construction and differ from the conventional design in a special form of torque arm and radius rod and front springs pivoted to the frame at the rear instead of at the front, as usual, for easy steering. Both models have individual-clutch constant-mesh gearsets and final worm drive.

Waukesha engines, with the cylinders cast in block on the smaller model and in pairs in the larger, are mounted under conventional hoods. Valves are at the right in each case. Cooling is by centrifugal pump with cast-case radiators and vertical finned-tube cores. The kerosene-burning equipment costs $100 extra on each model. It warms the incoming air, keeps the fuel at a temperature of from 100 to 140 deg. Fahr.; warms the carbureter and makes the fuel mixture contact with hot manifold parts. The fuel is fed by vacuum from a main tank under the seat.

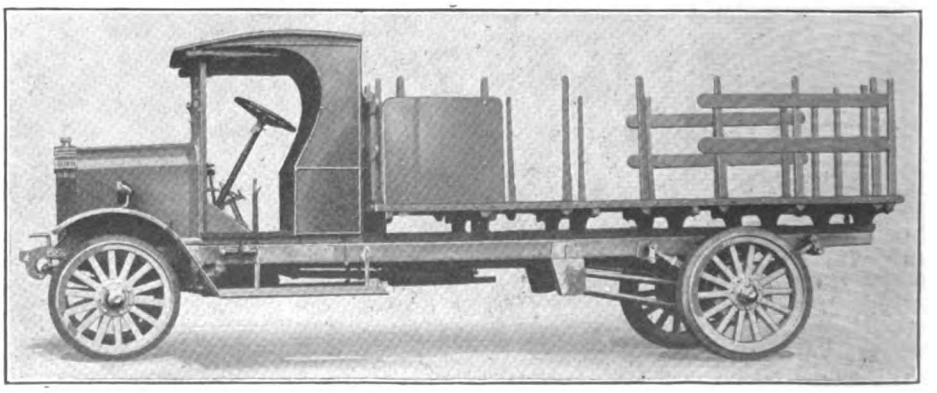
Centrifugal governors are employed and either electric starting and lighting or lighting only may be had as an extra at $125 or $75. Ignition is by the single system with fixed advance. The individual-clutch gearsets have three speeds. Frames are of pressed steel of the semi-flexible type, and left steer and center control are employed.

MANLY SPECIFICATIONS

Capacity, lbs.	3,000	5,000
Price	$1,800	$2,250
Wheelbase, in.	156	168
Tires, front	36 x 4	36 x 4
rear	36 x 5	40 x 7
Bore, in.	3¾	4
Stroke, in.	5¼	5¾
N. A. C. C., hp.	22.50	25.60
Speed, r.p.m.	1,150	1,000
m.p.h.	16	14
Gear-ratio in high gear	7.7—1	8.6—1
Final drive	Worm	Worm



Manly chassis at right; above, front spring anchored at rear and rear drive rods which take drive on both and torque by balancing pull on one against push on other



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Men and Makers

PACKARD MOTOR CAR CO., Detroit, will increase its monthly truck output from 600 to 1000. Foreign shipments will be resumed as soon as the Government requests that such aid be given the Allies. The Packard company had discontinued this branch of the business in December.

Maxfer Truck & Tractor Co. is moving from Chicago to Harvey, Ill. It will occupy the former plant of the Packless Valve Co., which will be equal to double the capacity of the present plant.

Nash Motors Co., Kenosha, Wis., will double its present truck production. The factory executives have decided to produce more Jeffery trucks this year than the maximum number of passenger cars ever made by the plant in a single season.

United States Motor Truck Co., Cincinnati, Ohio, has tripled the capacity of its machine shops, most of which are running day and night.

Wichita Falls Motor Co., Wichita Falls, Texas, has received an order for 400 trucks from the Russian Government. They will be manufactured at the company's home plant and must be delivered within the present year. It is reported that the company may build a branch plant in Dallas, Texas.

Willys-Overland Co., Toledo, Ohio, has installed one of the largest steel presses in the world to be used for making side rails for the larger models of the Willys-Overland motor vehicles. The machine weighs 325 tons, stands 31 ft. high, is 20 ft. wide, and is embedded in 15 ft. of solid concrete. Four men working at this machine can turn out 2000 side rails each 8-hr. day. The machine required a year to construct. Six flat cars were used to transport it to the factory. This is the second machine of its kind to be installed in the Willys-Overland plant. The first, a toggle press of 1000-tons pressure, was put in last spring.

Willys-Overland Co., Toledo, Ohio, has set aside 76 acres in ¼-acre plots on which employees can grow vegetables.

Ford Motor Co., Detroit, manufactured, shipped, and sold 72,100 motor vehicles in the month of March.

Moreland Motor Co., Los Angeles, Cal., expects to occupy the first new building of its projected plant at Burbank, a suburb of Los Angeles. The present assembly plant of the company will be retained and the company will enter upon the complete manufacture of commercial vehicles in place of the assembled product which it is turning out at present. The plans of the company also call for the manufacture of a low-priced passenger car designed to burn distillate.

De Martini Motor Truck Co., San Francisco, Cal., has erected a building at 435-449 Pacific Street in which it will manufacture 1-, 2-, 3-, and 4-ton trucks.

Noble Motor Truck Co., Kendallville, Ind., expects to start manufacturing during the early part of May.

Famous Trucks Mfg. Co., a new company located in St. Joseph, Mich., has taken over the plant of the Deitch-Denton Co. and will start operations shortly.

Studebaker Corp., South Bend, Ind., held a conference of the supervisors of the commercial car department recently at which 20 supervising salesmen throughout the country were represented. All angles of the motor truck business were discussed.

Smith Motor Truck Corp., maker of the Smith Form-A-Truck, is moving its New York offices from 1875 Broadway to new quarters on Sixty-fourth Street just west of Broadway.

General Motors Co., Detroit, plans to erect a large Buick plant on the Pacific Coast. The plant will probably be near the Chevrolet buildings in Oakland, Cal.

Connecticut Motor Sales Co., Hartford, Conn., has taken the Connecticut agency for Denmo trucks.

Columbus Motor Car & Truck Co. has taken the central Ohio agency for Selden trucks.

Motor Distributers Co., San Francisco, Cal., agent for the Indiana truck in northern California and Nevada, has moved from 744-746 Folsom Street to 1244-1246 Mission Street.

Economy Motor Truck Co., New York distributor of U. S. trucks, has combined its sales and service department, which is now housed in one building at 306-308 West Sixty-fourth Street, New York.

John V. Wilson Co., Boston, Mass., has taken the Make-A-Truck agency for Massachusetts.

Leach-Frawley Motor Co., San Francisco, Cal., has been made distributor for the Smith Form-A-Truck for northern California.

Kelly-Springfield Tire Co., Springfield, Ohio, has broken ground for a new plant at Cumberland, Md., which will afford a capacity at least four times that of the Akron, Ohio, Wooster, Ohio, and Buffalo, N. Y., plants combined.

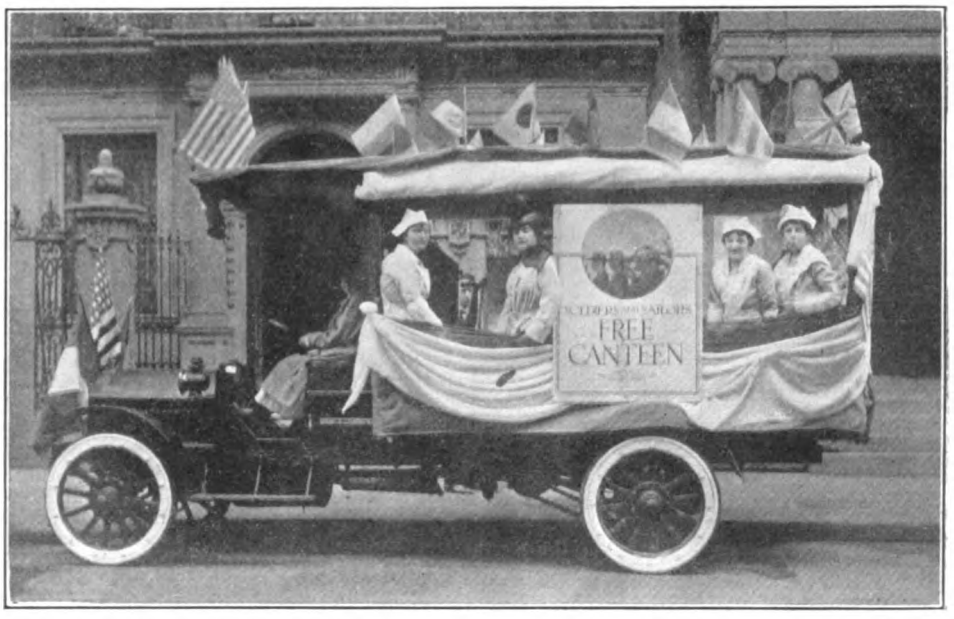
Dowse Rubber Co., Chicago, has announced that it is negotiating for two factories which are now making pneumatic tires and mechanical goods. The company has been organized with an authorized capital of $2,500,000 by B. C. Dowse, who was formerly president and general manager of the Federal Rubber Mfg. Co., Milwaukee.

Duesenberg Motors Corp., Edgewater, N. J., which recently succeeded the Loew Victor Engine Co., Chicago, and the Duesenberg Motors Co., St. Paul, has started the manufacture of automobile and aeroplane engines at its Edgewater plant.

Springfield Body Corp., Detroit and Springfield, Mass., will open a service station at its new factory in Springwells, Mich.

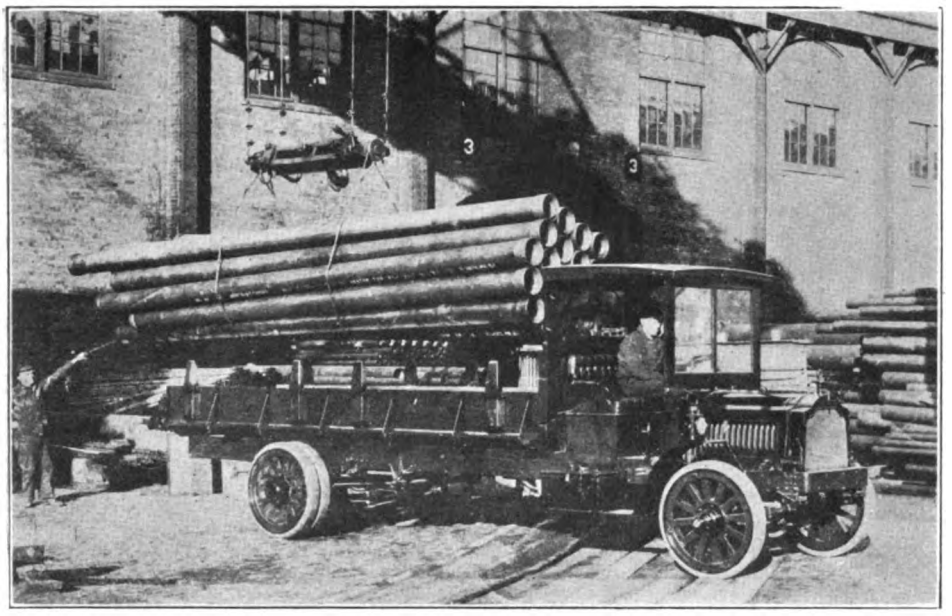
S. F. Bowser & Co., Fort Wayne, Ind., states that all of its employees who enlist in the army or navy may be sure of getting their jobs back when honorably discharged from the service.

Kelsey Wheel Co., Windsor, Ont., maker of bodies and wheels, expects to double its factory plant by building additions in the near future.



Paul Revere roused Concord, Mass., on April 19, 1775; but the float pictured above was an eye-opener for 600,000 persons on April 19, 1917. This motor truck load of trained nurses was one of the features of the "Wake Up, America!" day parade on Fifth Avenue, New York. The herald of the Revolution did not have as big an audience as his successors, but he was a 100 per cent recruiting officer and no one in America has reached that record since

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This shows the method of the National Tube Co., Pittsburgh, Pa., for reducing the loading time on its trucks. The load is made up and suspended while the truck is out on duty and the vehicle backs up under the load when ready for it. A 4-ton Packard is pictured doing this work

Wagner-Hoyt Mfg. Co. has acquired all manufacturing rights of the Volta magneto.

Columbus Auto Brass Co., Columbus, Ohio, has contracted to supply all metal parts for Garford trucks made by the Gramm Motor Truck Co., Lima, Ohio.

Sunderman Corp., Newburgh, N. Y., maker of the Sunderman mouse trap or vacuum carbureter, will open a brass foundry in the early part of May. The foundry will have a capacity of 1000 castings a day at the start and later will reach 3000. The new building will be 27 by 100 ft., three story, and of brick structure. The company expects to produce 200,000 carbureters this year.

Waverly Novelty Co., Pittsburgh, Pa., which recently purchased the electric clock business of the Stewart-Warner Speedometer Corp., has made arrangements to establish a plant in Rockton, Ill.

E. A. Laboratories, Inc., Brooklyn, N. Y., maker of motor vehicle accessories, has purchased the Automobile Supply Mfg. Co., Brooklyn, N. Y., together with its good will, trade marks, patents and all unfilled contracts and orders on hand.

Wm. H. Rankin Co., Chicago and New York, is the new name of the Mahin Advertising Co., which has been in the advertising field for eighteen years.

Walter F. KeNey Co., New Haven, Conn., has added Service trucks to its line.

The Automotive Electric Assn. has been formed by the manufacturers of electric accessories for motor vehicles. G. Brewer Griffin, Pittsburgh, Pa., is president; C. O. Miniger, Toledo, Ohio, vice-president; G. S. Cole, Cleveland, Ohio, secretary, and C. L. Amos, Syracuse, N. Y., treasurer. The next meeting of the organization will be at Hot Springs, Va., May, 17, 18 and 19.

J. P. Burris has joined the sales force of the Diamond T Motor Car Co., Chicago. He was formerly with the Packard Motor Car Co. of New York.

G. A. Gibson has been named production manager of the Diamond T Motor Car Co., Chicago. He was formerly manager of the motor truck division of the Packard branch in Kansas City, Mo.

R. L. Warner has been made district manager for the Moreland Motor Truck Co., Los Angeles, with headquarters at San Diego. For the past 10 years he has been Chicago branch manager for the Remy Electric Co.

C. F. Potter has been appointed to the production efficiency department of the United States Motor Truck Co., Cincinnati, Ohio. He is now on a trip among the various manufacturers who supply materials for U. S. trucks, in the interests of securing the maximum efficiency in the delivery of materials to the factory.

Carl Burton has been placed in charge of material at the Diamond T Motor Car Co. plant, Chicago. He was formerly with the Packard branch, Kansas City, Mo.

F. A. Trinkle has been appointed field service manager of the United States Motor Truck Co., Cincinnati, Ohio. He will visit the U. S. truck dealers and train them in standardized methods of rendering service.

C. W. Moody has been appointed manager of the export department of the United States Motor Truck Co., Cincinnati, Ohio.

Vernon E. Bush has been appointed to the foreign sales department of the White Motor Truck Co. of New York. He was formerly vice-president and assistant sales manager of the Advance-Rumely Co., La Porte, Ind.

Walter F. Schmitt has been appointed district manager of the Packard Motor Car Co. for territory west of the Mississippi River, including Cincinnati, Ohio, and Memphis, Tenn., excepting a part of the Pacific Coast. His headquarters will be at Detroit.

O. E. Brown has been appointed district manager of the territory east of the Mississippi by the Packard Motor Car Co., with the exception of Cincinnati, Ohio, and Memphis, Tenn. His office will be in Detroit.

T. J. Sullivan has been appointed New England traveling representative for the Four Wheel Drive Auto Co., Clintonville, Wis. Mr. Sullivan was formerly with the Buick branch in Boston, Mass.

John B. Orman has been appointed manager of the Indiana Doble Steam Car Co., Indianapolis, Ind., which will distribute the Doble. Mr. Orman was formerly with the sales and advertising department of the Premier Motor Mfg. Co.

Max Olsen, Seattle, Wash., has left his position as district representative for the Velie factory in the Northwest to be sales manager in the same territory for the Roesch Motor Car Co.

C. O. Assmus has resigned his position as manager of the Maxwell export field sales department.

H. F. Daniels has joined the executive staff of the Dort Motor Car Co., with headquarters at Detroit. He was formerly director of publicity for the Kissel Motor Car Co.

Ralph Kaye has been appointed publicity director of the Kissel Motor Car Co.

Clifford V. Herbert, son of Victor Herbert, the composer, has decided to enter the manufacture of tractors in Detroit. He expects to have the first model completed the early part of May and to be turning out eighty a month by July. Mr. Herbert has been working at the Ford Motor Co. plant.

E. T. Backus will open a Ford branch in Baltimore. He has been first assistant sales manager of the Ford Motor Co.

Louis C. Marle has become branch manager of the J. W. Leavitt & Co. Chevrolet branch in San Diego County, Cal. He was formerly manager of the used car department of the Willys-Overland Co. of California.

O. B. Henderson has been made manager of the Willys-Overland Co. of California. He was formerly manager of the Philadelphia branch of the company.

J. R. Murphy has been appointed manager of the retail truck sales department of the Farnsworth Motor Car Co., Seattle, Wash., Denby distributor.

Herman R. Smith has been appointed sales manager of the Kenworthy-Clark Co., Studebaker distributor in Rhode Island and southern Massachusetts. He was formerly assistant sales manager in New England for the Studebaker Corp.

Fred W. McIntosh has been made manager of sales of the Overland Fort Dodge Co., Fort Dodge, Iowa.

J. Roy Hiltz has been placed in charge of the new Locomobile agency opened at Providence, R. I., recently.

S. Bruce Sommervell has joined the staff of the Fentress Motor Car Co., Seattle, Wash., Peerless distributor. He was formerly with the Waterhouse-Sands Motors Co.

William M. Nevin has joined the sales force of the Earl B. Chase Co., Providence, R. I., Velie distributor.

C. J. Connors has been appointed manager of the St. Louis office and warehouse of the Marathon Tire & Rubber Co. He was formerly special representative of the company in the Southwest.

P. H. Diggle has been appointed manager of the Dallas, Tex., branch of the B. F. Goodrich Co. He has been assistant manager of the branch for some time.

Harry G. Moore, formerly branch manager at Chicago for the Velie Motors Corp., has been appointed Pacific Coast sales representative for the Star Rubber Co., with headquarters at Los Angeles, Cal.

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G. A. Richard has been appointed manager of the Michigan territory for the Firestone Tire & Rubber Co. He was formerly Pittsburgh, Pa., branch manager of the Firestone company.

G. W. Remington has resigned as director and secretary of the Simplex Rubber Co. of America, Ossining, N. Y.

Harry L. Bill, formerly vice-president and general manager of the Springfield Body Corp., Springfield, Mass., has been appointed works manager of the Chalmers Motor Co., Detroit. Mr. Bill resigned recently from the Springfield company because of illness in his family.

Frank H. Trego is now located with the Trego Motors Corp. as managing vice-president of the company at New Haven, Conn. He was formerly research engineer with the Packard Motor Car Co.

J. G. Perrin, formerly chief engineer of the Timken-Detroit Axle Co., Detroit, who has been seriously ill with typhoid fever, has returned from a 3 months' trip to North Carolina and other points in the South.

L. C. McHugh of the Detroit Steel Products Co. has joined the Canadian Royal Flying Corps.

J. E. Duffield has been made general manager and treasurer of the Bailey Non-Stall Differential Co., Chicago.

H. A. Goddard has been transferred to the Detroit office of the Perfection Spring Co., Cleveland, Ohio. He was formerly with the New York office of the company.

J. G. Utz has been appointed chief engineer of the Standard Parts Co., Cleveland, Ohio. Mr. Utz is chairman of the standards committee of the Society of Automobile Engineers. He will have charge of the research work in the chemical laboratories of the Standard Parts Co.

C. H. Roberts has been appointed comptroller of the Hess-Bright Mfg. Co., Philadelphia, Pa. He was formerly factory accountant of the company.

Herbert H. Jinnett has been appointed credit manager of the Staybestos Mfg. Co., Philadelphia, Pa. He was formerly with the Bell Telephone branch in Philadelphia.

J. D. Vail has been made manager of the building materials department of the H. W. Johns-Manville Co.'s Chicago branch. He was formerly manager of the Salt Lake City office of the company.

W. C. Davies has become comptroller and secretary of the Burd High Compression Ring Co., Rockford, Ill., succeeding J. J. Linnen, resigned. Mr. Davies was formerly with the Chicago branch of the Hudson Motor Car Co.

J. F. Schiller, Jr., and L. Y. Ovitt have been promoted in the service of the Willard Storage Battery Co. Mr. Schiller has been appointed factory representative in the northern California territory, and Mr. Ovitt will be the factory representative for the company in the Northwest.

Louis Schneider has become sales engineer of the Harrison Radiator Corp., Lockport, N. Y. He was formerly sales engineer of the Hyatt Roller Bearing Co.

H. W. Scholl has become director of sales of the Walker M. Leavitt Co., New York, maker of Magnalite pistons and other parts. He was formerly sales engineer of the Splitdorf Electrical Co., Newark, N. J.

E. B. French has been made assistant to the eastern manager of the S. F. Bowser Oil Tank & Pump Co., Fort Wayne, Ind. He was formerly assistant manager of the Harrisburg, Pa., branch of the company.

Leon P. Britt has been appointed manager of the Buffalo, N. Y., factory service station of the American Taximeter Co.

C. D. Beeman has been placed in charge of the new Cleveland, Ohio, factory service station of the American Taximeter Co.

Robert Ritchie has joined the Alvan T. Fuller Co. staff to handle Packard advertising. He was formerly advertising manager for the C. S. Henshaw Co., Boston, Mass., Dodge dealer.

L. W. Nutt has left his position as secretary and purchasing agent of the Velie Motors Corp. to join the staff of the H. W. Cooper Saddlery Hardware Co., Moline, Ill.

W. G. E. Birkett has been appointed advertising manager of the Standard-Detroit Tractor Co., Detroit. He formerly held a similar position with the Gray Motor Co.

"How to Run an Automobile," by Victor W. Pagé, is a 178-page handbook with 72 engravings. It is published by the Norman W. Henley Publishing Co., 2, 4 and 6 West Forty-fifth Street, New York, and sells for $1. The volume, like earlier works on similar subjects by the same author, discusses in detail the construction of the gasoline engine, transmission and lubrication systems, differentials, carbureters and ignition systems. It gives starting and driving instructions and describes typical 1917 control systems.

A Patriotic Placard will be furnished to applicants who communicate with the Acason Motor Truck Co., Detroit. This card, which is designed for window, counter or desk use, bears the legend, "One President, One Flag, One Country—U. S. A."

"Profits for You" is an artistic booklet published by the Pull-More Motor Truck Co., Pittsburgh, Pa. Like most catalogs, it gives the specifications of the trucks, photographs of the separate parts, the vehicles in use, and the factory. The special feature of this booklet is its physical appearance. The cover is printed in dark blue and silver, and there is a small gilt-paper bag attached to the booklet by two cords representing the bags of gold which the owner of Pull-More trucks may expect to earn.

A Saving of $7 per Thousand Feet in hauling lumber was effected by the use of a Jeffery Quad, according to G. W. Benton, secretary and treasurer of the Conneaut Shovel Co., Conneaut, Ohio. The Conneaut company had a timber tract of 40,000 ft. of white ash. and although it offered $10.50 per 1000 to have it hauled, no way was found to move it until a Jeffery Quad was used.



THE LATEST IN TOWER TRUCKS

One of the best-equipped street railway tower trucks has just been completed and placed in service by the United Railways of Baltimore, Md. It is a Mack worm-driven chassis, built by the International Motor Co., New York City, and especially designed for the work of the railways company. The truck is equipped to replace the derailed cars, to remove obstructions from the track, to repair wires, to temporarily repair damaged cars and even to fight fire if need be, being provided with fire extinguishers and hose jumpers consisting of small track bridges placed on the rails over the fire hose so that the trolley cars can cross over hose lines without cutting them. The truck is provided with a three-section telescopic tower with a revolving platform at the top. The tower may be elevated to the height of 20 ft. The vehicle is equipped with a four-cylinder 40 h.p. engine for greater speed than ordinary on commercial vehicles of the same capacity and is provided with a strong searchlight to aid in night repair work

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Complete U. S. Army Specifications for 1½- and 3-ton Trucks

Prepared by the Motor Transport Board of the War Department and in Accordance with the Recommendations of the Truck Standards Division, the Springs Division and the Electrical Equipment Division of the Society of Automotive Engineers and Approved by the Quartermaster General

COMPLETE specifications for 1½- and 3-ton trucks for U. S. Army use, issued on April 12, 1917, are given herewith, except for the general conditions under which bids are to be rendered and the data to be supplied with proposals to furnish such trucks. This information is of use to the truck bidder only and was included in paragraphs Nos. 1 to 23 and in No. 279. The elimination of these paragraphs explains the gaps in the data given herewith.

The specifications beginning on this page apply to 1½-ton trucks only, the modifications for the 3-ton vehicles being given on page 44.

Description

24. LOAD CAPACITY: The trucks must be of sufficient strength, and provided with sufficient power, to carry and propel the following gross load under the most severe service conditions:

Pay load	3,000 lb.
Body	1,050 lb.
Three men	525 lb.
Extra equipment	200 lb.
Total	4,775 lb.

The extremely severe service conditions under which these trucks will be operated indicate that they should be designed for a nominal pay load of 4000 pounds.

25. LOAD DISTRIBUTION: The distribution of load between front and rear axles, with the normal pay load equally distributed in the standard truck bodies herein specified, shall be not less than 80 per cent nor more than 95 per cent of the rear wheels in two-wheel drive trucks. In four-wheel drive trucks the total weight of the loaded vehicle shall be as equally divided as possible between the front and rear wheels.

26. WEIGHT OF CHASSIS: The maximum weight of chassis, without body or extra tool and parts equipment, and without gasoline, water, or oil, must be not more than 6000 lbs: A definite statement must be made showing exactly what equipment is included in the stated weight.

27. ROAD SPEED: The governor on engine shall be set so as to give a road speed of 15 miles per hour, with a maximum engine piston speed of 1100 feet per minute.

28. TYPE OF DRIVE: The trucks may be provided with any suitable standard type of drive, such as internal gear, bevel gear, worm gear, or chain drive. Preference will be given to that type of final drive which provides the greatest amount of ground clearance, in conjunction with provision for retaining grease or oil and excluding dirt.

29. Either two-wheel drive or four-wheel drive may be employed.

30. TRACTIVE EFFORT: The tractive factor obtained by dividing the net tractive effort at the tire surface of the driving wheels by the total weight of the fully loaded truck shall be not less than .0775 on high gear, and not less than .338 on low gear. This tractive effort shall be based on 85 per cent efficiency of power transmission from engine to drive wheels on high gear, and on 70 per cent efficiency of power transmission from engine to drive wheels on low gear.

31. GROUND CLEARANCE: The ground clearance at all parts of truck, except at drive sprockets and hub brake drums, shall be not less than 9¾ inches. The ground clearance at the center of truck between front and rear wheels shall be not less than 18 inches, and the difference between this center clearance and the axle clearance may be decreased in proportion to the distance from the center of the truck. The clearance under engine pan shall be not less than 11 inches.

32. WHEEL BASE: The wheel base must be suitable for the use of a 10-foot body, and shall be not less than 124 inches nor more than 150 inches.

33. TURNING CIRCLE: The truck shall be so designed as to turn in a circle of not more than 55 feet, measured from outside wheel tracks. Positive stops must be provided to limit the steering angle of the steering wheels.

34. GAGE: The gage of wheels on 1½-ton trucks, measured from center to center of felloe bands, shall be as follows:

4-in. single tires	58½ in.
6-in. single tires (Used on 4-wheel drive)	60½ in.
7-in. single tires	61½ in.

Engine and Cooling System

35. ENGINE: The engine must be of the 4-cycle type, water-cooled, having not less than four cylinders, and provided with mechanically-operated poppet valves. It shall have a total piston displacement of not less than 312 cu. in. and must develop a torque of not less than 2000 inch pounds at not more than 1,000 ft. of piston speed per minute. The torque at 500 ft. of piston speed per minute shall be not less than 90 per cent of the maximum torque. The engine must be under a removable hood, and located in a readily accessible position. The hood must be waterproof, readily removable without removing screws or bolts, and must open up sufficiently wide to permit of easy access to engine for inspection or adjustment. All main and connecting rod crank bearings shall be so designed as to be easily adjusted to take up wear. The piston pin bearing shall consist of a suitable phosphor bronze bushing properly secured in the connecting rod end. The valve stem guides and push rod guides shall not be cast integral with the cylinder casting, but must be separate parts, properly secured in place. The lower half of the crank case must be removed without disturbing the main bearings or the clutch housing, or removing the engine from the chassis. The unit power plant type of construction will not be permitted. The transmission must be mounted as a separate unit.

36. CYLINDERS: The cylinders shall be cast from best quality grey iron, and must be free from sand holes, blow holes, cold shuts, or other imperfections. The bore of finished cylinders must be the same diameter from end to end, and finished to a tolerance of plus or minus 0.0005 in., for diameter and eccentricity.

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37. The water jackets of cylinders must be tested under a hydrostatic pressure of 100 lb. per square inch, which test they must withstand without leaking.

38. The cylinders must be rigidly bolted to the crank case by means of a proper number of stud bolts in crank case, and double nuts, or single long type of tight fitting nuts. The stud bolts must accurately fit the holes in cylinder casting, the diameter of the hole being not more than 1/32-in. greater than the diameter of the bolt.

39. The water passages in jackets shall be of large area and volume, must extend entirely around the valve seats, and must offer as little obstruction as practicable to the flow of water. The water passages shall be so designed as to secure a uniform flow of water through all parts of the jacket. The water must circulate freely between the cylinders and the jackets must be free from air pockets, or dead ends where the water is unable to circulate freely. The jacket space must be so designed that all water will drain completely from the jackets when the lower drain cock on radiator or water circulating system is opened.

40. The compression space in each cylinder must be accurately calibrated and the cylinders selected so that the clearance volume of each cylinder is the same as that of any other for the same engine within 1 cu. cm.

41. PISTONS: The pistons shall be designed and constructed in accordance with the best standard practice. They shall be light in weight, heavily ribbed to secure proper strength, and made of best quality gray cast iron, free from blow holes, sand holes, shifted cores, or other imperfections. They shall be properly annealed, machined with light cuts to avoid distortion and ground to a high finish, proper tolerance, and a suitable clearance in cylinders.

42. The clearance between maximum diameter of piston and the diameter of cylinder bore shall not be less than 0.003 in. nor more than 0.005 in. They shall be properly tapered or relieved at the head end to provide for expansion, and shall have an internal stiffening flange at the open end.

43. Suitable means must be provided for preventing an excess of oil from working past the piston rings and into the combustion space, and at the same time securing proper lubrication of the piston and all bearings connected with the crank case.

44. The pistons shall be of such length as to give a low bearing pressure on the cylinder walls. The piston must also be so designed and constructed as to avoid slapping at all loads and governed engine speeds.

45. The pistons complete with rings and piston pins must be selected for weight, so that each piston will be the same in weight as any other piston for the same engine, with a tolerance of plus or minus ½ ounce.

46. PISTON PINS: The piston pins shall be hollow, with a wall of proper thickness. They shall be made of steel of suitable quality for the purpose, properly hardened, and ground to a high finish and proper tolerance. The harness of piston pins shall not be less than 470 Brinell, as a base for comparative scleroscope readings.

47. The piston pin shall be a light driving fit in both of the piston bosses. The piston pin shall be fastened only in one piston boss, and the fastening must be made by an approved device which will positively lock the piston pin in the piston boss, and prevent it from coming loose.

48. PISTON RINGS AND GROOVES: The piston shall be provided with at least three ring grooves of proper width and depth, all located between the wrist pin and the head end of piston. These grooves shall be ground to a high finish at the sides. Piston ring grooves to be finished as in S. A. E. practice.

49. If the triple type of ring is used, having one internal ring and two external rings, two ring grooves may be used, each provided with a triple ring, or one groove may be provided with a triple ring and the other with the ordinary type of single ring.

50. The single rings shall be machined to a high finish and proper tolerance on outside periphery, and ground on sides in accordance with S. A. E. recommended practice.

51. The rings must be of proper tension, and installed with only sufficient opening between the ends to provide for expansion of the rings under maximum temperature conditions.

52. VALVES: The intake valves and exhaust valves must be interchangeable, and made of alloy steel of best quality for the purpose.

53. The complete composition of the steel must be stated definitely, and all valves must be heat treated to develop the proper physical properties.

54. The valves must be ground to a thoroughly gas-tight fit in the valve seat.

55. The valves must be constructed of one piece for both stem and head, must have a large radius fillet between the stem and head, and must be provided with 45 degree seats.

56. All parts of valve mechanism must be completely inclosed. If the engine is of the L-head or T-head type, the valve springs, stems, and tappets must be inclosed by a suitable readily removable cover plate, and if the engine is of the valve-in-head type, the over-head valve mechanism must be completely inclosed with a suitable readily removable cover, or the bearings for rocker arms must be provided with suitable felt washers to prevent the entrance to dust or dirt.

57. VALVE TIMING: The flywheel of engine must be provided with marks, referred to a readily observable pointer or reference mark, showing the upper dead center, lower dead center, and the opening and closing positions of both inlet and exhaust valves, for each cylinder.

58. VALVE STEM GUIDES: The engine shall also be provided with suitable pressed-in or bolted-in valve stem guides. The use of valve stem guides cast integral with the cylinders will not be permitted.

59. VALVE SPRINGS: The springs for both intake and exhaust valves shall be made of best quality steel, of proper strength for the maximum speed of the engine, and designed so as to withstand a long period of service without sagging or breaking. These springs shall be heat treated to develop the proper physical properties.

60. VALVE LIFTERS: The valve lifter must be made of the most suitable steel and of proper design, with glass hard wearing surfaces (not less than 90 scleroscope). It must have a suitable adjustment for height, which is easily accessible, and which will retain the adjustment and not shake loose. The adjusting device must be strong enough to withstand heavy strains with a wrench in adjusting without distorting or stripping of threads.

61. VALVE LIFTER GUIDES: The engine shall be provided with suitable valve lifter guides of proper material, which will be either bolted or pressed into the crank case. The use of valve lifter guides cast integral with the crank case or cylinders will not be permitted.

62. CONNECTING RODS: The connecting rods shall be of I-beam section, drop forged from steel equal to S. A. E. steel No. 1035, and properly heat treated.

63. The crank end of the connecting rods shall be provided with bronze bushings faced with a proper thickness of best quality bearing metal.

64. These bearings shall be scraped to a proper fit with the crank, and in proper alignment at all positions of the crank, and for two-bolt rods shall be held in place with suitable doweling. The bearing shall be provided with proper grooves and oil holes for lubrication.

65. The bearing on piston pin shall be in the connecting rod end, and a suitable solid phosphor bronze bushing, pressed in, shall be used.

66. The bearing at each end of connecting rod shall be large enough to withstand long periods of severe service without the necessity of replacement or adjustment.

67. The cap end of connecting rod shall be made of the same material as the connecting rod, and shall be held to the rod and bearings by means of suitable bolts made of best quality alloy steel equal to S. A. E. specification No. 2330, or 3130, properly heat treated to give an elastic limit of 80,000 pounds per square inch minimum, reduction of area 55 per cent minimum, and elongation 18 per cent in 2 inches minimum, provided with suitable castellated nuts and cotter pins.

68. The complete connecting rods for each engine must be selected for weight, so that each connecting rod shall be of the same weight as that of any other connecting rod for the same engine, with

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a tolerance of plus or minus one-half ounce. The crank ends of connecting rods, and also the piston pin ends, must weigh the same with a tolerance of plus or minus one-fourth ounce.

69. CAM SHAFT: The cam shaft shall be constructed of S. A. E. steel No. 1020 or alloy steel of best quality for the purpose, the cams properly case hardened, and both the cams and bearings ground to a proper finish and size.

70. The cams must be forged integral with the cam shaft, and the bearings shall be of such size as to permit the shaft to be removed without removing the bearings, or the bearings must be readily removable with the cam shaft. The gear connection for cam gear shall be a flange, which is forged integral with the cam shaft and provided with a central boss for centering the cam gear.

71. The cams shall be designed and ground to such shape as to secure quiet operation of the engine and maximum torque, and shall have wide bearing faces in order to prevent undue wear of the cams or valve lifters.

72. CAM SHAFT BEARINGS: The cam shaft shall be provided with not less than three bearings for a four cylinder engine. The cam shaft bearings shall be of the best quality phosphor bronze or equal bearing metal. They shall be provided with an effective means for securing a proper circulation of oil through the bearings from the pressure oiling system.

73. GEARS: The cam shaft gear may be of cast iron, but the smaller gears on crank shaft and on magneto, generator and pump shaft must be of steel. These gears must be machine cut, and all gears accurately adjusted to a quiet running fit under load. They must also have sufficient width to insure long wearing life. The cam shaft gear connection may be adjustable in order to permit proper valve timing, but must be provided with suitable means for retaining the adjustment.

74. CRANK SHAFT: The crank shaft shall be forged from a single piece of steel, equal in quality to S. A. E. specifications No. 1045, and heat treated to develop the following minimum physical properties:

Brinell hardness 250-275 (Scleroscope 41-45).

Reduction of area 45 per cent.

Elongation 16 per cent in 2 in.

75. The crank shaft shall be sufficiently large in section at all points to prevent objectionable torsional or lateral vibration at all practicable engine speeds and loads.

76. Both crank bearings and main bearings shall be large in area in order to give low bearing pressures and long bearing life without replacement or adjustment. The crank shaft shall have not less than three main bearings for a four cylinder engine.

77. The crank pins and main bearings of crank shaft must be ground to a high finish and a total tolerance of 0.0005 in. for eccentricity, and a tolerance of plus or minus 0.0005 in. for diameter.

78. The crank shaft must be accurately balanced for static and running balance, at the governed speed of the engine.

79. Suitable means must be provided for preventing cylinder oil from creeping out of the crank case at the end of bearings, or at any other part of the crank case.

80. The flywheel flange must be forged integral with the crank shaft. This flange must be large in diameter and so designed as to secure an accurate centering of the flywheel on the flange. The bolts used in fastening the flywheel to crank shaft shall be of suitable diameter, and of material equal to S. A. E. specification No. 2330 or 3130, properly heat treated to give an elastic limit of not less than 80,000 lb. per square inch, reduction of area of 40 per cent minimum, and an elongation of 16 per cent in 2 in. minimum. For inspection purposes these bolts must have a scleroscope hardness of not less than 35 nor more than 42. If the bolts take the driving strain they shall be of large diameter and tightly fitted in reamed holes in both members.

81. CRANK CASE: The crank case is to be divided in a horizontal plane, with all bearings in the upper section. It must be so designed as to be light in weight and also of proper strength, and must be provided with suitable ribbing in order to secure a strong case free from distortion or weakness, and without excessive weight. It should be so designed as to permit any piston to be removed from its cylinder and taken out of the case without removing the cylinder or crank shaft.

82. All oiling receptacles, pipes, and oil guides, except the constant level troughs for connecting rods, shall be either pressed or cast integral with the crank case, or the oil pipes may consist of external leads. If external leads are used, they shall be short and rigid, or properly clipped to prevent vibration and chafing.

83. The oil settling chamber on engine must be provided with a suitable threaded plug for draining. The use of a drain cock will not be permitted.

84. The crank case must also be provided with an effective oil level indicating device, of the bayonet blade type.

85. The crank case must be a smooth casting, free from defects of material, design or construction.

86. All joints or connections in crank case shall be made thoroughly oil tight.

87. The bearings shall consist of heavy split bronze bushings, and one set of these bushings shall be provided with side flanges to take end thrust. These bushings shall be faced with a suitable thickness of best quality bearing metal, and provided with proper oil grooves. The bearing cars shall be of proper design, and made of material suitable for the purpose. These caps shall preferably be held in place by means of alloy steel bolts of proper size provided with castellated nuts, with suitable cotter pins. Not less than three main bearings shall be provided in a four cylinder engine.

88. The main crank shaft bearings and the connecting rod bearings shall be finished to an accurate bearing surface.

89. The main and connecting rod bearings shall be provided with laminated metallic shims, made up of sheets of equal thickness. The shim sheets shall be not more than .0015 inch in thickness.

90. OIL CAPACITY: The oil reservoir of engine must have sufficient capacity for lubricating oil to permit the truck to run fully loaded a distance of not less than 200 miles over ordinary roads without replenishing the supply of oil.

91. The oil filler and breather tubes on crank case shall be provided with a non-removable, fine mesh, brass screen, and also another screen of same construction which is removable. The filler tube cap shall be hinged and provided with a spring which will hold it in the closed position. This cap must not permit the entrance of water, and must also have a sufficiently large opening to properly vent the crank case.

92. LUBRICATING SYSTEM: The engine shall be lubricated by a pressure oiling system. The oil pump must be positive driven and provided with suitable screens of not less than 30 mesh, and which are readily removable for cleaning. It is desirable that the oil pump and screens be so arranged as to make the screens self-cleaning by an intermittent reverse flow of oil. The inlet to oil pump must be a sufficient distance above the bottom of oil reservoir to provide a suitable settling chamber.

93. The oil pump must deliver a large volume of oil, and must maintain a pressure of not less than 30 pounds per square inch, at an engine speed of 800 r.p.m. A suitable relief valve on the oiling system must be provided.

93a. FRICTIONAL HORSE POWER: The engines furnished with trucks must be thoroughly "run-in," so that the trucks may immediately after delivery be placed in continuous severe service without danger of damage to the engines. When the trucks are delivered the engines must be in such condition that the power required to drive any engine at 1000 feet of piston speed, and with the fan and pumps in operation, shall not exceed 16 per cent of the rated horsepower of the engine with wide open throttle at the same speed.

94. SUSPENSION: The engine must be mounted with a three-point suspension, or on a sub-frame having a suitable three-point suspension which will effectively prevent the distortion of the frame from straining any part of the engine, clutch, or transmission.

95. STARTING CRANK: The starting crank must be readily accessible, and located in such a position as to be protected against damage from minor collisions. If necessary, it may be of the folding type. The removable type of starting crank will not be acceptable.

96. The engine and starting crank must be so mounted that the extreme distortion of the frame of truck will not

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prevent the ready engagement and operation of the starting crank.

97. GOVERNOR: A centrifugal type motor speed limiting governor of approved make shall be provided and adjusted so as to prevent the truck from exceeding a speed of fifteen miles per hour on high gear. The governor shall be adjustable and must have provision for sealing the adjustment and all connections of drive shaft with suitable lead seals.

98. ENGINE SHIELD: Suitable means must be provided to protect the carburetor, magneto, and generator from water and mud. If a removable shield is used it must be fastened by means of spring clips which will permit it to be removed with the hands only, and without tools of any kind. In case the engine crank case is provided with cast or stamped webs equally as effective as the engine shield herein described, the engine shield will not be required.

99. CARBURETOR: The carburetor must be of such design, and provided with such heating devices, as will enable it to utilize gasoline having an initial boiling-off temperature of not less than 122 deg. Fahr., a 25 per cent boiling-off temperature of not less than 230 deg. Fahr., a 50 per cent boiling-off temperature of not less than 300 deg. Fahr., a 90 per cent boiling-off temperature of not less than 350 deg. Fahr., and a dry point temperature of not less than 400 deg. Fahr. The engine must utilize gasoline of the grade mentioned above, and at the same time operate with satisfactory economy and regularity at all engine speeds and loads.

The carburetor and engine intake manifold must be provided with S. A. E. standard flanges.

100. The carburetor should be adjustable, and provided with means, readily accessible from the driver's seat and from the cranking position, for enriching the mixture when starting. The mixture must not be enriched by depressing the float, but this must be accomplished by the air control or the operation of the needle valve. If the mixture is enriched by the operation of the needle valve, the original carburetor adjustment must not be changed. A suitable drain cock must be provided at the bottom of the float chamber. The intake manifold must be provided with a suitable water jacket, and the carburetor must be installed in as high a position as practicable. The use of aluminum in the construction of the carburetor will not be permitted.

101. DUST COLLECTOR: A dust collector of suitable design and construction must be installed and connected with the carburetor main and auxiliary air intakes. It must be readily accessible for cleaning. It is desirable that the crank case breather tube be connected with the dust collector in order to prevent dust from entering the crank case.

102. MUFFLER: The muffler must be of substantial construction, and so designed as to give the minimum back pressure and effectively muffle the exhaust. It must be so constructed and installed as to be readily taken apart for cleaning. The final exhaust not to be directed downward. The muffler must be provided with a suitable cut-out, with a spring which will hold the muffler valve positively in either the open or the closed position. The cut-out must not be operable from the driver's seat. The muffler must be located in such a position forward of the rear axle as to make it impossible for it to be knocked off due to the truck dropping into deep ditches, or passing over high ridges.

103. GASOLINE TANK: A suitable drawn steel gasoline tank, with welded joints, shall be provided, having a capacity of not less than thirty gallons. This tank shall be thoroughly tinned both inside and outside. Tanks with soldered joints will not be acceptable.

104. A metal partition shall be installed on the inside of tank of such height as to give a capacity of six gallons on each side of the partition. Suitable baffle plates shall be installed on each side of partition in order to prevent excessive splashing. The connection from tank to carburetor shall be made from the bottom of each compartment, through a three-way cock, thus giving a positive reserve supply of six gallons. A readily accessible shut-off valve shall also be provided in the gasoline supply line to carburetor.

105. If a pressure system is provided, the three-way cock may be installed at the top of tank with the supply pipes extending from same to the bottom of each compartment in tank.

106. A suitable gasoline strainer with drain cock shall be installed in a readily accessible location, and in the gasoline line between the tank and carburetor. The gasoline pipe line and pressure tubing shall consist of thoroughly annealed brass or copper seamless tubing, not smaller than ⅜ of an inch outside diameter, properly fastened at suitable intervals to prevent vibration or chafing, and arranged so as to completely drain through either the tank, carburetor, or strainer. All fuel and pressure pipe connections are to be S. A. E. standard fittings.

107. Suitable means must be provided for draining the gasoline from a flooding carburetor on to the ground without permitting any gasoline to get into the engine pan or to accumulate on any part of the chassis.

108. The gasoline tank must be installed high enough to permit the gasoline to flow to the carburetor when the truck is climbing the maximum grade which it is capable of negotiating under the most favorable road conditions, and with the minimum amount of gasoline in the tank. If necessary, a pressure feed system may be employed. The tank must be provided with a mounting which will prevent straining the tank due to frame distortion.

109. COOLING SYSTEM: The cooling water must be pump circulated, and the system must be so designed that it may be completely drained by opening a single drain cock. The drain cock must have a free opening not less than one-fourth inch in diameter, and must be located in such a position as to permit the water to run directly into a bucket placed under the drain cock. Thermo-syphon systems will not be acceptable. The water pump must be of such design as to permit thermo-syphon circulation in case of pump failure. The use of the gear type of pump will not be permitted.

110. The radiator must be of such design as to insure uniform and free circulation of water, and mounted in such a manner as to prevent damage to radiator due to severe vibration or twisting of the frame. It must also be readily repairable without special equipment. A tie rod with universal connection at the radiator end must be fitted.

111. All parts of radiator in contact with water shall be thoroughly tinned. Suitable baffle plates shall be provided in order to secure a uniform circulation of water through the entire radiator.

112. Ample area for the circulation of air through the radiator shall be provided and also proper outlet area shall be provided to permit the free passage of the heated air away from the rear of engine. Suitable louvres shall also be provided in each side of engine hood. The hood should be supported independently of the radiator.

113. The radiator shall be of the fin and tube type, having cast or pressed upper and lower headers, with bolted-on cooling section or sections. If the cooling section consists of individual tubes with fins, the tubes must be not less than ⅜-inch outside diameter. If the fins are continuous, the tubes may be a minimum of one-fourth inch in diameter. The overflow pipe must be of copper or brass, and not smaller than ⅜-inch tubing.

114. The radiator shall have a frontal area involving section only of not less than 2.25 square inches per square inch of piston swept surface, and a total radiating surface in radiator of not less than 90 square inches per square inch of swept surface. The piston swept surface shall be obtained by multiplying the circumference of cylinder bore by the length of stroke, by the number of cylinders.

115. RADIATOR HOSE: The distance between the ends of radiator hose connections and ends of hose connections of engine shall be not less than .3 of the distance from the center of third point of support to the center of the hose connections of engine. The connections for hose on both engine and radiator must be not less than 2 inches in length. Both the upper and lower radiator hose must be non-collapsible.

116. A suitable fan and fan housing shall be provided which will cause a rapid circulation of air through all parts of the radiator, and insure proper cooling of the circulating water. The fan pulley and fan belt driving pulley must be so arranged as to permit of the ready replacement, adjustment, or removal of the belt. The fan belt and fan pulley must be constructed in accordance with S. A. E. standards. The belt shall be 2

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inches in width, and provided with a spring take-up.

117. It is desired that the magneto, generator, coil, timer, battery and muffler be kept as high as practicable.

118. STARTING MOTOR: Suitable provision must be made either on the engine or elsewhere, for the installation of a starting motor, of proper size and design. The starting motor is not to be furnished, but the truck must be so arranged as to readily permit of its installation at any time if so desired. The flywheel must be provided with gear teeth for use with the starting motor. These gear teeth must be cut in accordance with S. A. E. recommended practice.

119. ELECTRIC LIGHTING AND IGNITION: The truck must be provided with a suitable electric lighting system and dual ignition system. The electric lighting system shall consist of a generator driven from the power plant, a reverse current voltage cut-out, 100 ampere hour, 3 cell, lead acid battery, or 75 ampere hour 5 cell nickel-steel alkali battery, electric lights, fuses, wiring and other necessary details. The ignition system shall consist of a high tension magneto of best make, and a battery and coil ignition system. One distributor and one set of spark plugs may be used in common with the two separate ignition systems. The current for battery ignition will be taken from the electric lighting battery. Both battery ignition and magneto must be readily controlled from the driver's seat, and the spark advance lever on steering wheel must control both ignition systems, and give a suitable degree of spark advance for all positions of the spark advance lever. The range of spark advance shall not be less than 30 degrees of crank angularity. The full retard position of the spark lever shall retard the battery spark at least 3 degrees after top center.

120. If the high tension magneto or generator is coupled to a driveshaft, two universal joints or a flexible coupling must be used in the driving connection, in order to prevent binding of bearings. The flexible coupling, if used, must provide for parallel and angular displacement.

121. GENERATOR: The generator shall be of the fully inclosed direct current, constant voltage, type, and must have a continuous capacity of 12 amperes. The voltage of the generator when installed on the truck shall be 8 volts at 1 ampere, and 7 volts at 12 amperes, within limits of plus or minus .2 volt. The voltage regulation must be the same with varying engine speeds, up to governed engine speed. It must be driven from the engine by means of suitable gears or silent chain drive. The gears or silent chain drive must be completely inclosed, thoroughly lubricated, and effectively protected from dust and dirt. If driven by means of silent chain drive, the chain must be readily adjustable. Definite data in reference to the material and construction of chain drive gears must be given.

122. ARMATURE: The armature shall be of the laminated drum type, with the windings thoroughly insulated, and so installed in the slots as to effectively resist the action of centrifugal force at the maximum guaranteed speed of armature. After the coils are properly secured in the slots and the armature coil terminals are securely soldered into slots in the ends of commutator segments, the entire armature shall be treated with an insulating compound by a suitable impregnating process. The insulating compound shall have suitable insulating qualities, and shall not soften under a continuous temperature of 250 degrees Fahrenheit. The armature shall also be of proper electrical, magnetic, and mechanical balance.

123. Suitable means must be provided for preventing oil from the bearings from collecting on the commutator or armature.

124. Suitable anti-friction or sleeve bearings of best quality shall be fitted in each of the end frames. The bearings shall have proper means for ready lubrication, shall be a proper fit on the armature shaft, and shall not be so loose as to cause vibration of the armature at any practicable engine speed. The ratio of engine to generator speed must be given, and also the maximum permissible speed of the generator. The generator must be run at a constant ratio of engine speed, and no friction drives or constant speed devices will be permitted. The speed of generator in any case must not be more than twice the engine speed. The generator drive connection must be made direct with the engine, or with some part of drive connection between the engine and clutch.

125. The brushes of generator must be the self lubricating type, having a spring take up which will give a proper tension on the brush during its entire wearing life. The brushes must be easily accessible and readily removed or replaced without removing or loosening other parts, and must have ample area of cross-section and area of contact to prevent excessive heating under continuous maximum permissible load. The brushes must be practically sparkless at all speeds, and at all loads from no load to maximum permissible load.

126. COMMUTATOR: The commutator must be constructed of best quality hard copper of uniform density, and the segments properly insulated with sheet mica or micanite of suitable thickness and proper density to wear equally with the copper segments. The mica between segments shall be undercut approximately 1/32-inch.

127. REGULATION: All voltage and current regulating devices shall be contained in assembly with the generator. No separately mounted controlling devices will be permitted. The use of sliding contact devices for current or voltage regulation and the use of permanent magnets in the construction of generator is also prohibited. If a voltage regulating device is used it must be provided with suitable seal.

128. CHARGING SPEED: The generator shall begin to charge the battery at an engine speed of not more than 500 r.p.m., and at the same time furnish the current necessary for ignition.

129. HIGH TENSION MAGNETO: A high tension magneto of best make must be installed on the engine, and positively driven either by gears or by a silent chain drive. If driven by gears, the gears must run in oil, and if driven by silent chain drive, the chain must be readily adjustable. In either case the chain or gears must be completely inclosed and thoroughly lubricated. The magneto must be arranged for clockwise rotation. Both the magneto and the mounting for same must be constructed in accordance with S. A. E. recommended practice.

130. The magneto must be provided with a suitable waterproof cover of proper construction, arranged so as to be securely fastened around the magneto and readily removable.

131. The magneto must be so designed as to exclude dust, water and dirt, and must be provided with a suitable water and dust proof cover of proper material and construction, and arranged so as to be securely fastened around the magneto and readily removable.

132. One distributor may be used in common for both battery ignition and for the magneto. The distributor must be of the waterproof type and provided with a suitable safety gap.

133. The breaker points must be of platinum-iridium, and the breaker box and contacts must be easily accessible and readily adjustable. The breaker box must completely inclose the breaker mechanism, and prevent the entrance of dust, water or dirt.

134. The magneto must be provided with a suitable spark advance arrangement, which will enable the magneto to deliver an adequate strength of spark at all positions of the spark advance lever. The definite range of spark advance must be given in the proposal, and must not be less than 30 degrees of crank angularity. The breaker box must be reversible or provided with two levers on opposite sides.

135. The sector for spark advance lever must be plainly marked START and RUN for the most suitable battery starting and running positions.

136. With battery ignition the strength of spark must be adequate for all engine speeds, and the spark lag must be as small as practicable. The definite amount of spark lag in degrees of crank angularity must be given for all engine speeds, with a fixed setting of the spark advance lever.

137. Complete details of the construction of the magneto, with drawings and illustrations, must be submitted with proposal.

138. The guaranteed length of spark between needle points must be given with engine running at 100 revolutions per minute, and for both battery ignition and high tension magneto the lag of spark in degrees of crank angularity must be given for all practicable engine speeds.

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139. The primary and secondary cable shall be constructed and tested in accordance with the latest recommendations of the Society of Automobile Engineers.

140. TINNING TEST: All copper wires must withstand the following tinning test: Samples will be properly selected to secure an average grade of tinning. The samples will have the insulation carefully removed, and the wires of cable carefully separated and straightened. The wires will then be thoroughly cleaned by means of ether, benzine, gasoline, naphtha, caustic alkali solution, or hot water and soap, whichever may be found necessary to thoroughly clean the wires.

141. The wires shall then be rinsed in clear water and wiped dry with a soft cotton cloth. The wires will then be immersed for one minute in a solution of hydrochloric acid having a specific gravity of 1088 at 70 deg. Fahr. and then rinsed in clear water and wiped dry as above specified. The wires shall then be immersed for 30 seconds in a solution of sodium polysulphide having an excess of sulphur, then rinsed in clear water and wiped dry.

142. The complete cycle of operations shall then be repeated, commencing with the immersion in hydrochloric acid and ending with the immersion in the sodium polysulphide solution.

143. Tests of tinning will be made on not less than ten sets of samples of reasonable length. All wires must withstand one immersion in the hydrochloric acid without blackening in the sodium polysulphide solution, and 75 per cent of the wires must withstand three immersions in the hydrochloric acid without blackening in the sodium polysulphide solution. All tests shall be conducted with the solutions at a temperature of 70 deg. Fahr.

144. LIGHTING EQUIPMENT: The truck shall be provided with the following lighting equipment:

1—Searchlight, with quick acting vertical and horizontal adjustment, silver plated brass or copper parabolic reflector, or glass parabolic reflector silvered on the back, with 21-c.p. tungsten focusing bulb.

2—Side lamps, combination oil and electric, with 8-c.p. 6-8 volt tungsten bulbs.

1—Electric instrument lamp, with 2-c.p., 4-volt bulb, and one combination oil and electric tail lamp with 2-c.p. bulb, connected in series.

1—Portable trouble lamp, 8-c.p., with cord, and plug with separate socket.

1—Ammeter of best make, for indicating the charge and discharge of battery.

145. SEARCHLIGHT: The searchlight shall be not less than 10½ inches in diameter outside of front flange. The body of lamp shall be spun or pressed from one piece of heavy brass, copper, or steel. In the design of the lamp no parts shall be used which are liable to shake loose from vibration. The reflector shall be parabolic in form, spun or pressed from brass or copper of suitable thickness, and heavily silver plated. The reflector may be of glass, silvered on the back. The searchlight shall be of dustproof construction.

146. The searchlight shall be provided with a suitable handle, and means for clamping the searchlight securely in any desired position. The searchlight shall be installed on the chassis in a location permitting it to be readily operated from the driver's seat, and also in such a position as to be unobstructed from the front.

147. This lamp shall be provided with a single point bayonet socket with two wire connections, and a suitable focusing device.

148. SIDE LAMPS: The two side lamps shall be best quality combination oil and electric, of suitable design and construction, and fitted with standard S. A. E. single point, grounded return sockets, and 15-c.p. 6-8 volt tungsten bulbs. The oil fonts shall be so designed that they cannot rattle or drop out. These lamps shall be made of heavy gage sheet steel or brass, thoroughly riveted and soldered, fully black enameled, and fitted with forged steel yoke brackets or installed in dash. They shall have large glass semaphore front lens.

149. The instrument light socket shall be the single point type with two terminals for wires. One terminal will connect with source of current supply, and the other will connect with a wire leading to the one point grounded tail light socket, thus putting the instrument light and tail light in series.

150. TAIL LAMP: The tail lamp shall be the same as specified for side lamps, except that the large semaphore lens shall be of red glass colored in the glass composition, and the side glass may be omitted. The bulb shall be 2-c.p., 4 volt, connected in series with bulb of the same size and rating in instrument lamp. The tail lamp bracket shall be made of forged steel, and shall be located in such a position as to prevent it from being knocked off due to collision, or to the rear wheels of truck dropping into deep ditches.

151. TROUBLE LAMP: The portable trouble lamp shall consist of a suitable hardwood handle through which the cord shall pass, and provided with an S. A. E. standard, single contact socket, with two connections for wires, a lamp guard of proper design, and an 8-c.p., 6-8 volt tungsten bulb. The other end of cord shall be provided with a suitable single point combination plug for connecting with a ground return socket. The cord shall be No. 14 B & S gage, flexible, twin-conductor, rubber covered, double braided, packing house cord of best make. The portable trouble lamp shall be provided with an S. A. E. standard, single point, flush type, flanged socket, installed in a readily accessible location, preferably on the dash, and connected with the lighting switch.

152. AMMETER: Furnish and install in a suitable location a flush type ammeter of best make, having a double scale for indicating the charge and discharge current of battery, and provided with a black dial bearing white figures. It shall be installed in such a location as will permit it to be readily observed from the driver's seat, and properly illuminated by the instrument light.

153. This ammeter shall be connected in the circuit leading from the negative terminal of battery. The ammeter must be so designed as to not be affected by severe vibration. It must have a light moving system and be dead beat in action. It must be thoroughly insulated, and be so designed as to avoid short circuits due to the loosening of parts.

154. EXTRA LAMP BULBS: The following extra lamp bulbs shall be provided, installed in a suitable metal case:

2—21-c.p. 6-8 volt tungsten bulbs of best make, with single point Ediswan bases.

4—8-c.p., 6-8 volt, tungsten bulbs of best make, with single point Ediswan bases.

2—2-c.p., 4 volt, tungsten bulbs of best make, with single point Ediswan bases.

155. The bulb case shall be of heavy seamless steel, with a heavy seamless steel hinged cover with automatic spring catch. The bulbs shall be held securely in place by means of brass springs and a suitable locking device. The case must be of proper size to hold the above lamps without the lamps touching each other or the sides, top, or bottom of the case. The case shall be thoroughly coated, both inside and outside, with best quality black enamel.

156. WIRING: The trucks shall be wired with the system of installation known as the ground-return system. In this system of wiring the chassis frame or bare metal is used as the return circuit. All ignition wiring must be protected from water and oil, and mounted in such a manner as to prevent chafing.

157. All wring and electrical equipment shall be constructed, installed, and tested, in accordance with S. A. E. recommended practice.

158. CONDUIT: Whenever practicable the wires shall be carried in either rigid or flexible metallic conduit. The flexible conduit is preferred. The conduit shall be securely fastened by means of galvanized straps and galvanized machine screws of proper size. The ends of the conduit must point downward so that water will not run into the conduit.

159. CLEATS: Where wires are not protected with conduit they shall be securely cleated at intervals of not more than 10 inches. Such cleats shall be of galvanized steel of proper thickness and width, and secured with suitable screws. Galvanized steel machine screws in tapped holes shall be used in all cases where the fastening is to be made on metal.

160. FUSE BOX: A four-circuit fuse box of proper design shall be installed in a readily accessible location.

161. The fuse box shall be of best make, and constructed of molded insulating material in both box and cover, or the box and cover may be of black enameled steel suitably lined with a proper insulating material. The wires shall all enter the fuse box from below, and be a snug

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fit in the opening in box. If steel boxes are used the holes in the box where wires enter shall have suitable insulating bushings, and the fuse clips must be mounted on a base of suitable insulating material, securely fastened to back of box by suitable brass screws. The heads of screws shall be deeply countersunk below the surface of the base.

162. EXTRA FUSES: One complete set of extra fuses will be provided and attached by means of suitable spring clips to the inside of fuse box cover.

163. CIRCUIT BREAKER: If a circuit breaker of an approved type is installed, the fuses herein specified will not be required.

164. SWITCHES: The ignition switch shall be a triple point switch of best make with one point for battery ignition, one point for magneto ignition, and the other point for cutting out the high tension magneto by grounding.

165. The lighting switches shall be the push or pull type of flush switch of best make, mounted in a location readily reached from the driver's seat, and provided with a heavy brass gang switch plate, in dead black finish.

166. GROUNDING: Whenever an insulated conductor is connected to "ground," the connection shall be installed so as to be readily accessible and removable on the completed truck. In all cases where the connection is made to an iron or steel part, the iron or steel shall be thoroughly tinned at the point where the connection is made, and the ground connection shall be firmly maintained by means of screws or bolts with suitable lock washers. Brass or copper lugs of proper size shall be used for all ground connections. The lugs shall be properly soldered to the ends of cables.

167. All cables shall be continuous from connection to connection. The splicing of cables will not be permitted. All cables shall be provided with suitable lugs or terminals wherever practicable. Where the use of terminals is not practicable, the ends of cables shall be tightly twisted, formed into a solid loop of proper size for the screw connection, and the loop thoroughly soldered.

168. BATTERY: Furnish and install on the truck a 100 ampere-hour, 3-cell lead acid battery of best make, for ignition and lighting only, or a 75-ampere hour, 5-cell, nickel-steel, alkali battery of best make, at the option of the government.

169. The battery shall be installed in a heavy pressed steel case, with waterproof hinged cover with latch. The inside of case must be 6½ inches wide, 16¾ inches long, and 9⅝ inches high.

170. BATTERY TERMINALS: The battery terminals and connections must be so arranged as to prevent the possibility of the battery connections being reversed in relation to the generator terminals.

171. SPARK PLUGS: The spark plugs shall be constructed in accordance with the latest recommendations of the Society of Automotive Engineers, and the large Hexagon type of shell provided with a single sparking point shall be used. The spark plug threads shall be ⅞ inch, 18 threads to the inch.

172. The plug must be provided with a porcelain of best make, packed with suitable copper gaskets and held in place with proper bushings.

173. The center electrode shall be made of metal which will not readily corrode, warp, or be burned by the hot gases, and must be packed thoroughly gas tight inside of the porcelain.

174. The ends of the high tension cable at spark plugs must be provided with suitable terminal properly secured to the cable and spark plug terminals.

175. The seat for spark plug gaskets shall be finished to a smooth and plain surface, and the seat shall be at right angles to the center line of spark plug.

Frame and Body

176. FRAME: The frame shall be constructed of pressed steel or standard rolled structural sections. The frame and suspension must be so designed as to prevent cramping of any part, due to distortion of frame because of uneven road condition.

177. The distance from the back of the driver's seat to the rear end of frame shall be 10 feet. This frame length will permit of sufficient overhang of body to allow the installation of towing hooks and rear bumpers.

178. The frame shall be reinforced at proper intervals with suitable cross members thoroughly fastened to the frame with hot rivets or fitted bolts riveted over nuts. All holes in the frame shall be drilled, not punched. A suitable towing hook shall be attached to each side of the front end of frame. These towing hooks may be installed on the front bumper.

179. The frame shall be provided with two, best quality, dressed oak sills, one bolted on top of each frame side member. These sills shall be the same width as the flange on frame, and shall be of proper depth to give not less than five inches clearance between the rear tires and the side sill of body as shown on drawing Q.M.G.O. T-105. These sills shall be gained over all gusset plates or other irregularities on the frame, and shall be provided with not less than ten sets of body sill fastenings, as shown on drawing Q.M.G.O. T-107, and two angle plates with bolts as shown on drawing of body. The sills shall be painted with three coats of paint of the composition given on drawing.

180. FRONT BUMPER: A spring type of front bumper of suitable design and construction shall be provided, and properly bolted to the front of frame. This bumper must be so arranged as to not interfere with the starting crank. Front towing hooks shall be provided, one at each side of the frame. These towing hooks may be fastened to the front bumper, if arranged in an approved manner. No part of the bumper extending in front of the radiator shall be integral with the chassis frame.

181. REAR BUMPER: A rear bumper shall be provided as shown in detail on drawing T-102.

182. RADIATOR PROTECTORS: Each truck shall be provided with an effective radiator protector, which shall extend the full height and width of the radiator. This radiator protector shall be constructed of heavy structural steel shapes or steel castings, and shall be firmly bolted to the chassis frame. It must be so installed as to not interfere with the starting crank. Complete detail drawings showing the construction of this protector must be submitted.

183. STEERING GEAR AND WHEELS: The steering gear may be either the worm and wheel type or the screw and nut type, and means shall be provided for its thorough lubrication. Adjustments must be possible without removing the steering assembly from the frame.

184. A notched grip moisture proof steering wheel of best quality shall be provided, having an outside diameter of not less than twenty inches. The steering post must be rigidly mounted to prevent vibration, and must be provided with both spark advance and throttle levers.

185. The gear reduction and length of levers on steering gear must be such as to give easy turning action with the fully loaded truck, but the gear reduction must not be so low as to prevent sufficiently quick turning of the wheels in steering.

186. The ratio of movement between the steering hand wheel and the front road wheels shall be such that for 360 degrees travel of the steering wheel the road wheels will move not more than 40 degrees, and not less than 30 degrees about the steering angle pivot, for two-wheel steer.

187. Throughout the steering gear, including all steering connection joints, adequate provision must be made for lubrication.

188. STEERING CONNECTIONS: The steering knuckle tie rod, steering knuckle arms, and steering gear connecting rod, must be located back of the axle in order that the front axle may protect them against damage from obstructions. The steering knuckle tie rod must be straight from end to end, and located as far above the lower edge of axle as possible, and entirely protected by the axle from spring seat to spring seat.

189. All steering connecting rod joints shall be hardened steel sockets, held by springs in close contact with hardened steel balls. The steering cross rod joints may be of the ball and socket or clevis type.

190. LOCATION OF CONTROL: The gearshift and hand brake levers must be placed at the driver's right, with the hand brake lever to the right of the gearshift lever. The hand brake lever is to be pulled back for brake application. The gearshift lever must be fitted with a latch guarding the reverse position.

191. GEARSHIFT LEVER HANDLE

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POSITIONS: The gearshift lever handle positions shall be as follows:

First speed.....Forward and left.
Second speed...Rear and left.
Third speed.....Forward and right.
Fourth speed...Rear and right.
Reverse.....Guarded by a latch in separate gate. Extreme left through neutral, then forward.

192. CLUTCH AND BRAKE PEDAL: The clutch pedal should be located to the left, and the foot brake pedal to the right, of the fore and aft center line of the steering column.

193. ACCELERATOR PEDAL: The accelerator pedal shall be placed to the right of the brake.

194. SPARK AND THROTTLE HAND LEVERS: The spark and throttle hand levers shall be located to the right of the fore and aft center line of the steering column. The spark lever shall be the shorter of the two, and both levers carried on stationary sectors. The words "Spark" and "Throttle" are to be clearly marked on the levers. Both levers shall be arranged so that they are pushed forward to advance the spark and to open the throttle.

195. The spark and throttle sectors shall be marked to indicate the open and closed positions of throttle, and advance, retard, and battery starting positions of spark.

196. DATA PLATE: A suitable data plate must be installed in a readily observable location. The data on the plate must include the following:

Normal load capacity, pounds.....3,000
Maximum speed, miles per hour..... 15
Serial number of motor.....
Serial number of chassis.....

197. SEAT AND TOP: The trucks will be provided with seat and top shown on drawing Q. M. G. O. No. T-106.

198. FENDERS: The trucks must be provided with front fenders only. These fenders must be of suitable design and rigid in construction.

199. BODIES: Bodies are not to be furnished unless specifically called for. The construction of chassis shall be such as to permit the proper installation of body on same, having inside dimensions of 5′ 1″ wide, 10′ long, and 2′ high, with the floor of body at a height of not over 45 inches above the ground when the truck is loaded. The length of frame back of driver's seat shall be 10 feet.

200. In fastening the body to chassis, neither the frame nor the frame members shall be drilled, except the fastening for angle plate shown on drawing QM.GO. No. T-105. The body shall be fastened to the frame by means of suitable bolts, as shown on drawing T-107.

201. PAINTING: The entire chassis shall be first thoroughly cleaned of all dirt, grease, or oil, and covered with a coat of best quality, rust-resisting paint. It shall then be painted with three coats of best quality lead and oil, olive drab color, of the following composition:

6 lbs. white lead ground in linseed oil,
1 lb. raw umber,
1 pt. turpentine,
½ pt. japan drier.
1 qt. linseed oil.

202. Each coat must be permitted to become thoroughly dry before applying the next coat.

Transmission and Running Gear

203. CLUTCH: The clutch may be either dry multiple disc or dry single disc type, having one series of plates faced with wire asbestos friction material. It must be of suitable design for transmitting the maximum torque of the engine without slipping, must be easily accessible for repair or replacement of parts, and must be provided with a suitable arrangement for permitting easy engagement which will not require frequent adjustment or renewal of friction material.

204. Flanges must be fitted on the clutch pedal in order to prevent the driver's feet from slipping off of same. The pressure on the clutch pedal pad necessary to disengage the clutch must be not more than 90 pounds nor less than 70 pounds.

205. The clutch must be readily adjustable or provided with a spring which will give uniform action of the clutch during the wearing life of the friction material.

206. The clutch must be readily removable without disturbing the transmission, steering gear, motor, or other important parts, and must be provided with an effective clutch brake.

207. The clutch must be completely inclosed in order to prevent the entrance of dust, oil, or water.

208. The steel clutch discs must be properly hardened, and those without ring friction facing to be ground to a smooth surface.

209. All thrusts must be self-contained when the clutch is engaged.

210. The clutch release must be fitted with ball bearings, with adequate provision for lubrication. Plain clutch thrust bearings will not be acceptable.

211. TRANSMISSION DRIVE SHAFT: The transmission drive shaft, connecting clutch with transmission, must be provided with two universal joints of the lubricated bearing type. The fabric type of joint will not be acceptable. The joints must be entirely inclosed and means provided for suitable lubrication and for retaining the lubricant in the joint. Provision must be made to prevent the shaft whipping loose in the event of joint failure.

212. TRANSMISSION: The transmission shall be of the selective sliding gear type, and must have not less than four speeds forward and one reverse, and must be installed as a separate unit on a sub-frame between the engine and differential. It must be installed with a three-point mounting in order to prevent the distortion of frame from breaking the transmission legs. The high speed gear shall be direct without reduction in the transmission unless the truck is four-wheel drive.

213. The gears of transmission must be cut on suitable gear shapers or gear generating machine, from forged steel blanks of alloy steel equal to S. A. E. specification Nos. 2320, 3120, or 3320, properly case hardened and accurately assembled to a quiet running fit under load. These gears must have sufficient width of face and strength to transmit the full power of the engine at all gear ratios, with a proper factor of safety.

214. The splined driving shaft for sliding gears must be made of best quality alloy steel, properly heat treated.

215. The low gear ratio of transmission shall be suitable for giving a tractive factor of not less than .338, as required by paragraph 30, and the total low gear reduction of transmission and final drive shall be not less than 40 to 1.

216. The transmission case must be oil-tight, and must be provided with a filler plug on the top or side, a suitable drain plug on the bottom, and an oil level plug on the side of case.

217. The main drive shaft, and also the countershaft of transmission, must all be provided with ball or roller bearings of best make and suitable capacity. The use of plain bearings in the transmission assembly will not be permitted, except in the case of the reverse gear. If the bearings are adjustable, the adjustment must be accomplished by the use of shims.

218. The transmission must be accessible from below the body for inspection, adjustment, removal, or repair. Transmission gears constructed as an integral part of the rear axle, or in any other manner which does not provide proper spring suspension, will not be acceptable.

219. PROPELLER SHAFT: The propeller shaft connecting the transmission with the rear axle and differential must be of suitable size and strength to properly transmit the full power of the engine at all gear ratios, under the most severe service conditions. It must also be of such design, and must be supported in such a manner, as to prevent whipping or excessive vibration at all reasonable coasting speeds. The slip joint shall be fitted with an S. A. E. standard or similar spline connection.

220. SLIP JOINT: The slip joint for lower end of propeller shaft must be provided with S. A. E. standard splines, and must be designed in such a manner as to prevent the formation of a shoulder on the inside of joint. This slip joint must also be provided with a suitable tight fitting leather boot which will prevent the entrance of dust or water.

221. Suitable provision must be made for preventing the propeller shaft from whipping loose in case of the failure of the front universal joint.

222. Two universal joints must be provided between the transmission and differential. These universal joints must be so designed as to contain a proper quantity of lubricating grease, and must each be provided with a tight leather

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boot made of best quality, first cut leather. The use of fabric universal joints will not be permitted.

223. The leather boots specified must be provided irrespective of the type of universal joint which is employed, and must be provided at each end of boot with suitable screw clamps.

224. DRIVE AXLE: The trucks may be either internal gear drive, chain drive, worm gear drive, or double reduction gear in a central housing. The driving axle may be either full-floating or semi-floating type.

225. The design, material, and construction of the drive axle and final drive shall be in every respect in accordance with the best standard practice.

226. DRIVING AXLE BEARINGS: The driving axle must be provided with suitable solid steel taper roller or two-point ball bearings of best make. All bearings must be provided with suitable means for lubrication and for retaining the lubricant in the bearings. All thrusts must be compensated for by adjustable ball or roller bearings. The plain type of thrust bearing or three-point ball bearings will not be permitted.

227. The rear axle housing must be oil-tight, and must have an inspection plate, giving ready access to the inside of housing. An oil filler plug must be provided at a proper height to act as an overflow in filling. If the oil filler plug is located in the inspection plate, the studs for holding the plate must be so arranged as to prevent the plate from being reversed. The differential complete must be readily removable after removing the splined drive shafts.

229. DIFFERENTIAL: The differential shall be of such a type as to automatically permit the wheels to revolve at different speeds without complete loss of torque on either wheel, and also to apply at least normal torque to whichever wheel shall have traction. These requirements shall be met when the vehicle is running either forward or backward.

230. It shall consist of a forged steel or cast steel case, to which the large gear is attached by being bolted or riveted. This case shall also contain the necessary gears for producing the required differential action, and shall be provided with suitable steel roller or ball bearings of best make. The case shall be supported on its bearings independent of the drive shaft ends. The drive shaft ends shall be properly fitted and connected by means of suitable splines to the gears in differential case. The spline connection shall be made in accordance with S. A. E. standards.

231. All steel differential or driving gears shall be machine cut on suitable gear generators, from forged blanks of S. A. E. steel Nos. 2320, 3120, or equal, and properly heat treated.

232. The bevel drive pinion shall be forged integral with its shaft. This shaft shall be made of steel equal to S. A. E. specification No. X3335, properly heat treated, and provided with two sets of taper roller or ball bearings of best make, and provided with suitable means for the ready adjustment of the bevel driving pinion in relation to the large driven gear, and vice versa. If ball bearings are used, suitable means shall be provided to take care of thrust loads.

233. WORM OR BEVEL GEAR DRIVE: If the rear axle is of the worm or bevel gear driven type, it may be a built-up structure using steel tubes pressed or shrunk into a properly ribbed cast steel or malleable iron housing, or a suitable one-piece cast steel or malleable iron axle housing may be used without any steel tubes. Truss rods may be used at the discretion of the constructor, but the factor of safety of the rear axle load carrying assembly or member must be large enough to preclude any likelihood of breakage under the most severe service conditions.

234. INTERNAL GEAR DRIVE: If the final drive is an internal gear, provision must be made for entirely inclosing the driving gears, and for retaining the lubricating oil or grease, and for preventing same from getting onto the brake bands.

235. Both the spur driving pinion and the internal gear shall be machine cut from drop forged steel blanks. The internal gear ring may be made of carbon steel equal to S. A. E. specification No. 1020, properly heat treated for the purpose, but the spur driving pinion must be made of steel equal to S. A. E. specification Nos. 2320, 3120, or 3320, suitably case hardened. Both gears must have wide faces and must be so designed and constructed as to readily withstand the maximum power of the engine under the most severe service conditions, with a proper factor of safety.

236. All gears connected with this drive must be heat treated in the most suitable manner. The internal gear must be pressed onto turned flange on the wheel hub, and then firmly secured with suitable rivets.

237. The jack shafts shall be made of best quality chromium-nickel steel equal to S. A. E. specification Nos. 3140 or X3325, must be properly splined at each end for connecting with driving gear and differential, and shall be provided at each end with steel roller or annular ball bearings of best quality. These jack shafts shall be inclosed in steel tubing having flexible end connections in both the differential housing and the internal gear case, and these flexible connections shall be provided with suitable felt washers.

238. The wheel spindles shall be made of best quality chromium-vanadium steel equal to S. A. E. specification No. 6135, properly heat treated.

239. FRONT AXLE: The front axle shall be of I-beam section, drop forged from a single piece of carbon steel or alloy steel equal to S. A. E. steel No. 1035, and properly heat treated. The steering knuckles, and the steering knuckle levers, shall be drop forged from alloy steel equal to S. A. E. steel Nos. 2330, 3130, or 3325, and properly heat treated. The wheel spindles shall be provided with steel roller bearings of best quality, and provided with proper means of lubrication. The wheel hubs and bearings of both front and rear axles must be so designed as to prevent the entrance of water, dust or dirt, and also must prevent the leakage of grease from the hubs.

240. BRAKES: Two independent sets of double acting brakes shall be provided. The emergency brake must act directly on the rear wheels, and be operated by a hand lever with ratchet. Service brakes may act directly on the rear wheels or on the drive shaft, and must be operated by a pedal. Brakes must be lined with an approved friction material and must be so constructed that they may be readily adjusted and securely locked in adjustment without removing the wheels or other parts.

241. Suitable flanges must be fitted on the brake pedal to prevent the driver's foot from slipping off of same.

242. Brake rods are to be sufficiently stiff or so supported as to prevent whipping or rattling.

243. Brakes must be sufficiently powerful either to slip the wheels or stop the truck within a distance of not more than fifty feet, with either the service brakes or the emergency brakes, when the normally loaded truck is running on a level, hard, and dry macadam road at a speed of fifteen miles per hour.

244. The service brakes may act directly on the drive wheel, brake drums, or on the driving axle next to the propeller shaft.

245. Brake adjustments must be readily accessible, and must be adjustable without the use of special tools. All brake clevises, pins, or other bearings in brake rods or brake connection must be provided with bronze bushings.

246. The design of brakes and brake connections must be such that the application of drive wheel brakes is not affected by relative movement between the frame and axle.

247. Both the service brakes and the emergency brakes must be readily adjustable for taking up wear, and must be provided with as large an amount of radiating surface as practicable. Provision must also be made for holding the braking surfaces on brake bands or brake shoes concentric with the brake drum surface. The brakes must be so designed as to release completely and not drag at any point when the brake lever or pedal is released. The brake drums must be exactly circular, and the central opening in same fitted over a finished boss on the wheel hub, or other method equally effective which will retain the brake drum must be fastened to the wheel with suitable tight fitting bolts. Provision must also be made for preventing oil or grease from leaking out of the axle or drive shaft ends and getting onto the brake bands and drums.

248. All brakes must be mounted in such a manner that the braking strains will be taken by parts which are strong enough to withstand these strains under the most severe braking conditions.

249. WHEELS: The wheels shall be of suitable size for the use of 36-inch

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S. A. E. demountable solid tires, and shall be best quality cast steel wheels, of proper design, strength, and construction, and made in accordance with the best standard practice.

250. The wheels shall be of suitable size and design for the use of 36"x4" single, solid S. A. E. demountable rubber tires on front wheels, and 36"x7" single, solid S. A. E. demountable tires on rear wheels. All wheels shall be of proper strength to resist the vertical and lateral loads in the most severe service, and with the maximum load and speeds for which the truck was constructed.

251. The hubs of wheels shall be made of best quality cast or forged steel, free from blow holes which will impair the strength or finish of finished hub, and must be provided with best quality hardened and ground roller or annular ball bearings of proper size. The hubs may be integral with the wheel casting.

252. DEMOUNTABLE TIRE FASTENINGS: The steel fastenings for demountable tires shall be constructed in accordance with drawing Q. M. G. O. No. T-101. Trucks will positively not be accepted having tires or tire fastenings which differ from those herein specified.

253. TIRES: On two-wheel drive trucks the tires shall be 36"x7" single tires on rear wheels, and 36"x4" single tires on front wheels, both front and rear tires demountable.

254. On four-wheel drive trucks the tires shall be 36"x6" single, demountable, both front and rear.

255. All tires shall be best quality solid rubber tires on hard rubber base with S. A. E. steel rims. A sample section of the rubber tire and rim must be submitted with each proposal.

256. Complete detail and assembly drawings, showing the construction, material and dimensions of all parts of the wheels must be submitted.

257. HUB ODOMETER: A hub odometer of best make, and of suitable design and construction for most satisfactory use on motor trucks, shall be provided and installed on one of the front wheels. This odometer shall have not less than five figures in the dial, and provision shall be made to prevent leakage of grease into mechanism.

Springs

258. SPRINGS: The chassis spring suspension must be of such design and construction as to relieve the body and chassis above springs of excessive vibration when the vehicle is traveling empty or partially loaded over rough surfaces at maximum speed.

259. Springs must be made of alloy steel, heat treated to develop the following physical properties:

Minimum elastic limit, 170,000 lb. per square inch
Tensile strength, not less than 210,000 lb. per square inch
Elongation, not less than.....5% in 8 in.
Brinell hardness 390-470

Care must be exercised to prevent specimen from slipping in the grips and causing diagonal strains.

260. DEFLECTION OF SPRINGS: The deflection of rear springs shall be not more than 1,000 pounds per inch and not less than 800 pounds per inch. The deflection of front springs shall be not more than 800 and not less than 550 pounds per inch. The maximum deflection permitted by the permanent stops, both front and rear, must be given.

261. Spring eyes must be provided with phosphor bronze or soft steel bushings, pressed in and reamed in position to the S. A. E. limits of tolerance for such bushings. Bushings must have suitable lubricating channels and conform to S. A. E. standard of wall thickness. If phosphor bronze is used, it must be equal to S. A. E. specification No. 26.

262. Spring eye bolts must be hardened and ground to S. A. E. standard sizes and tolerances. Eye bolts must be securely anchored to prevent turning in the spring shackles, and be provided with suitable means for lubrication.

263. Spring shackle bolts or cross bars must be properly hardened and ground on bearing surfaces and be so designed as to provide at least equal projected bearing area to that provided by the eye bolts. Where shackle bolts are used in connection with bat shackles, they must be provided with suitable means of lubrication and be securely anchored to prevent turning in the shackle. The spring shackle bolts shall also be made to S. A. E. sizes and tolerances.

263a. SPRING SHACKLES: Spring shackles must be made of a material equal to S. A. E. specification No. 1235 for steel castings, and heat treated. They must have a center to center distance not less than the spring width, and may be of two types—Bar shackles formed of two plates with a connecting bar formed integral with them, or yoke shackles, having one end open and the other end connected and adapted to receive the shackle pin or bar. Where yoke shackles are used, they must be bushed at the shackle pin or bar end with a material equal to S. A. E. specification No. 26, or soft steel, bushing to have ⅛" walls, lubricating channels, and suitable means of lubrication. Yoke shackles must be so designed as to provide projected bearing area at the closed end at least equal to that of the spring eyes. Rear spring shackles must be in tension. Spring shackles or hangers must be so constructed as to prevent binding on the sides of the spring eyes or the supporting brackets.

264. SHACKLE HANGERS: Shackle hangers, when used in connection with bar shackles, must be bushed with a material equal to S. A. E. specification No. 26 or soft steel, said bushings to have ⅛" walls, and be provided with suitable lubricating channels and means of lubrication.

265. SHACKLE POSITION: In the design of springs and the assembly of same on chassis, the spring shackles must stand in approximately a vertical position when the spring is under full load, except on chain driven vehicles, where shackles must stand at an angle sufficient to allow chain adjustment without cramping the spring main plates.

266. SPRING LEAVES: Spring leaves must be held against longitudinal movement by means of an alloy steel center bolt of proper size, by an indentation in the center of each leaf, or by a combination of those methods. If center bolts are used, the head shall conform to S. A. E. standard, and be provided with snug fitting S. A. E. standard center bolt nuts and means provided for locking the nuts in position. Springs with shrunk-on center bands will not be acceptable because of the difficulty of making repairs in field service. Center fastening must be shown in detail on the drawing mentioned in paragraph 279.

267. SPRING CLIPS: Spring clips must be made of alloy steel equal to S. A. E. No. 3130 or 3320, properly heat treated, to develop physical properties equal to the following:

Elastic limit.....100,000 lb. per square inch
Tensile strength...130,000 lb. per square inch
Elongation .....20% in 8 in.
Reduction of area.....60% in 8 in.
Brinell hardness 295
Scleroscope 35

268. Spring clips must be constructed in accordance with S. A. E. standards. The chemical specifications, physical properties, and heat treatment must be given. The use of carbon steel spring clips will not be permitted. Nuts may be of carbon steel.

269. METAL SPRING CHAIRS: Metal spring chairs must be provided between springs and spring seats. Chairs must be so designed as to be held by the spring clips against longitudinal movement, and have one face shaped to conform to the shape of the spring when the spring is free or without load. The center of the chair must be recessed to properly receive the center fastening of the spring. Spring chairs may be omitted where the spring seat is shaped to conform to the shape of the spring when the spring is free.

270. PRESSURE BLOCKS: Pressure blocks, of a material equal to S. A. E. specification No. 1235 for steel castings, heat treated, must be provided between the spring clips and the spring, and must be grooved and conform to the shape of the spring clips where in contact with the clips. The face of pressure blocks must conform to the shape of the spring when the spring is free.

271. PERMANENT STOPS: All vehicles must be provided with permanent stops which will prevent the springs from being deflected to a point at which the stress will be greater than 75 per cent of the elastic limit of the material from which the springs are made. Suitable rubber or steel buffers must also be provided for both front and rear springs.

272. REBOUND CLIP: A suitable number of rebound clips must be provided on each spring, and attached in such manner as to retain their proper position. These rebound clips must be constructed in accordance with S. A. E. recommended practice.

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273. LUBRICATION: The lubrication of all spring connections must be through grease or oil cups, which must be so located as to be readily accessible and of ample capacity, and so designed as to prevent any part of the cup shaking loose through vibration. When cups are not formed integral with the spring connections, they must be screwed in position with standard ¼" taper pipe thread; at least four threads of shank must be engaged.

274. RETAINING ALIGNMENT: Springs must be provided with suitable means for retaining the leaves in proper alignment with each other. The method used must be shown in detail in the drawing mentioned in paragraph 279.

275. Scale formed on leaves during heat treatment shall be removed as thoroughly as possible without breaking surface skin.

276. All springs must be constructed and tested in accordance with S. A. E. standards and recommended practice, and must comply with these requirements.

277. DRIVING THRUST AND TORQUE: The driving thrust and torque may be transmitted through radius rods, the torque may be taken through torque arms, or the springs may be designed to take either or both torque and thrust.

278. If power or torque is transmitted through the chassis springs, the design must be such that the vehicle will not be rendered inoperative through breakage of the main or driving leaf of the spring, and the axle attachment must be such as to prevent relative longitudinal movement of the spring on its seat.

How Specifications for 3-ton Trucks Differ from Those of 1½-ton Vehicles

The specifications for 1½-ton trucks shall apply in the furnishing of 3-ton trucks, except in the following particulars. Numbers in brackets refer to paragraph numbers in the 1½-ton truck specifications.

1. (24) LOAD CAPACITY: The trucks must be of sufficient strength, and provided with sufficient power, to carry and propel the following gross load under the most severe service conditions:

Pay load	6,000 lb.
Body	1,500 lb.
Three men	525 lb.
Extra equipment	200 lb.
	8,225 lb.

The extremely severe service conditions under which these trucks will be operated indicate that they should be designed for a nominal pay load of 7,000 to 8,000 pounds.

2. (26) WEIGHT OF CHASSIS: The maximum weight of chassis, without body or extra tool and parts equipment, and without gasoline, water, or oil, must be not more than 8,000 pounds. A definite statement must be made showing exactly what equipment is included in the stated weight.

3. (32) WHEELBASE: The wheelbase must be suitable for the use of a 12 foot body, and shall be not less than 124 inches or more than 156 inches.

4. (34) GAGE: The gage of wheels on 3-ton trucks, measured from center to center of fellow bands, shall be as follows:

5" Single front tires—59½ to 64½ inches

5" Dual rear tires—64½ inches

5. (35) ENGINE: The engine must be of the 4-cycle type, water cooled, having not less than four cylinders, and provided with mechanically operated poppet valves. It shall have a total piston displacement of not less than 414 cubic inches and must develop a torque of not less than 2,475 inch pounds at not more than 1,000 feet of piston speed per minute. The torque at 500 feet of piston speed per minute shall be not less than 90 per cent of the maximum torque. The engine must be under a removable hood, and located in a readily accessible position. The hood must be waterproof, readily removable without removing screws or bolts, and must open up sufficiently wide to permit of easy access to engine for inspection or adjustment. All main and connecting rod crank end bearings shall be so designed as to be easily adjusted to take up wear. The piston pin bearing shall consist of a suitable phosphor bronze bushing properly secured in the connecting rod end. The valve stem guides and push rod guides shall not be as integral with the cylinder casting, but must be separate parts, properly secured in place. The lower half of the crank case must be removable without disturbing the main bearings or the clutch housing, or removing the engine from the chassis. The unit power plant type of construction will not be permitted. The transmission must be mounted as a separate unit.

6. (177) The distance from the back of the driver's seat to the rear end of frame shall be 11 feet 11 inches. This frame length will permit of sufficient overhang of body to allow the installation of towing hooks and rear bumpers.

7. (196) DATA PLATE: A suitable data plate must be installed in a readily observable location. The data on the plate must include the following:

Normal load capacity, pounds	6,000
Maximum speed, miles per hour	12
Serial number of motor	——
Serial number of chassis	——

8. (199) BODIES: Bodies are not to be furnished unless specifically called for. The construction of chassis shall be such as to permit the proper installation of body on same, having inside dimensions of 6' 6" wide, 12' long, and 2' high, with the floor of body at a height of not over 45 inches above the ground when the truck is loaded. The length of frame back of driver's seat shall be 11' 11".

9. (215) The low gear ratio of transmission shall be suitable for giving a tractive factor of not less than .338, as required by paragraph 30, and the total low gear reduction of transmission and final drive shall be not less than 50 to 1.

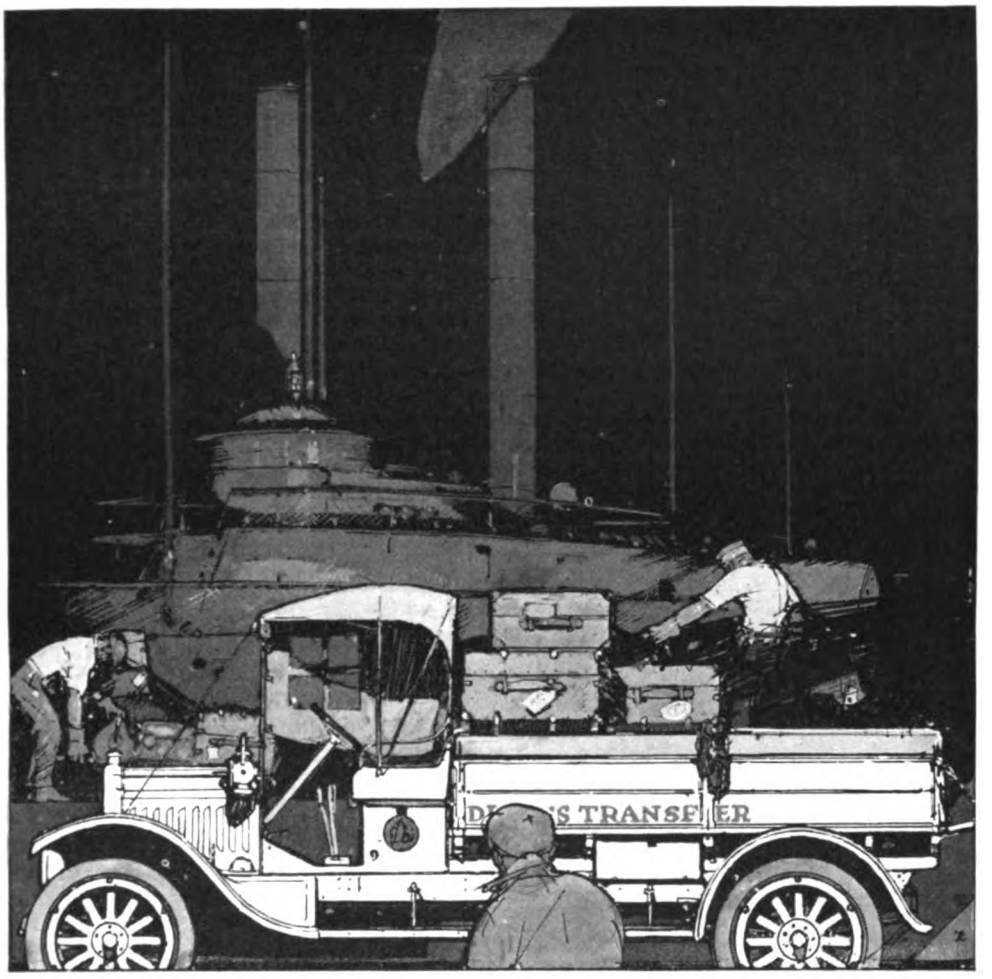
10. (250) The wheels shall be of suitable size and design for the use of 36" x 5" single, solid S.A.E. demountable rubber tires on front whels, and 36" x 5" dual, solid S.A.E., demountable tires on rear wheels. All wheels shall be of proper strength to resist the vertical and lateral loads in the most severe service, and with the maximum load and speeds for which the truck was constructed.

11. (253) TIRES: On two-wheel drive trucks the tires shall be 36" x 5" dual tires on rear wheels, and 36" x 5" single tires on front wheels, both demountable.

12. (260) DEFLECTION OF SPRINGS: The deflection of rear springs shall be not more than 1500 pounds per inch and not less than 1000 pounds per inch. The deflection of front springs shall be not more than 900 and not less than 650 pounds per inch. The maximum deflection permitted by the permanent stops must be given.

EDITOR'S NOTE—The standard specifications for 3-ton gasoline motor trucks are published by the government in the form of an appendix to the general specifications to indicate points of difference.

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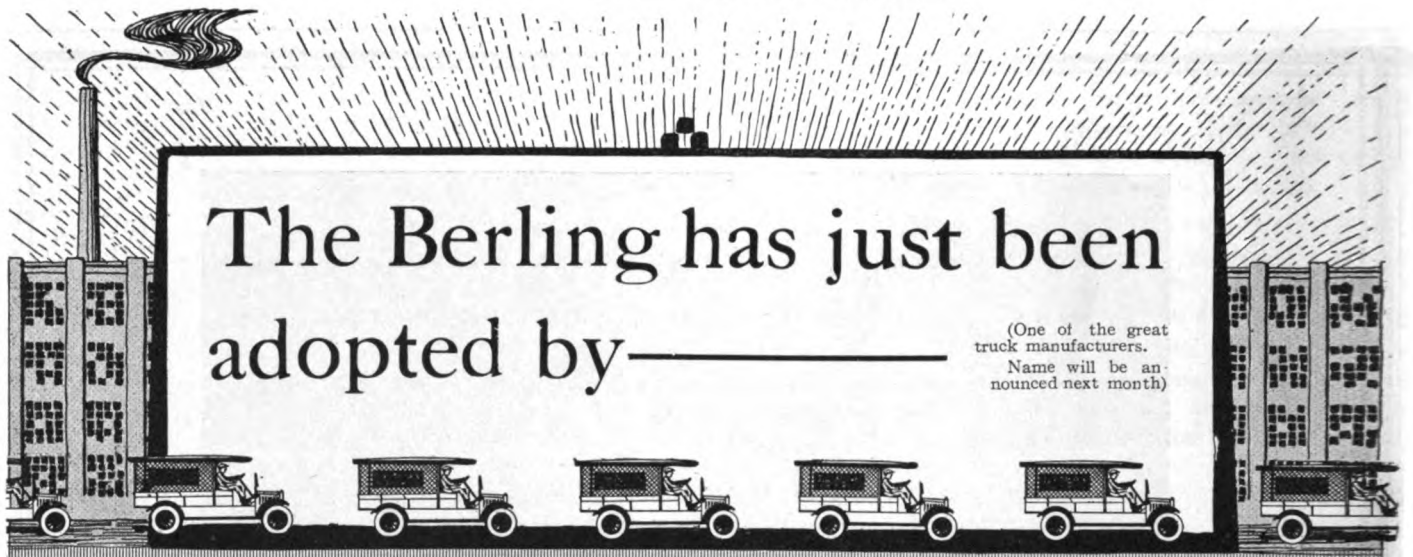


WHITE TRUCKS

WHAT a truck actually costs is not known until you have operated it for some time. The purchase price is often insignificant when compared with the maintenance and operating bills. The largest users of trucks consider it far cheaper to invest more money in White Trucks and enjoy unfailing service and low expenses over a long period of years — than to buy medium-grade trucks, pay higher bills for less dependable service and stand more rapid depreciation on the investment.

THE WHITE COMPANY
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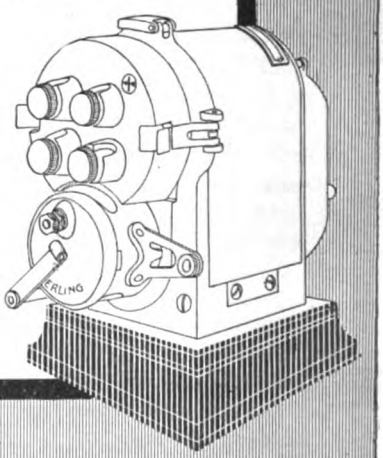
The Berling has just been adopted by———

(One of the great truck manufacturers. Name will be announced next month)

This manufacturer has Berlingized his trucks in order to insure against magneto-trouble and to help lower the upkeep of his trucks (which already cost notably little to run).

The acid test of Time has laid bare the facts of the Berling's merit. At sea, on land and in air, the Berling has defied dampness, dust, steep grades, storms and overloads.

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The New E-41 Berling for Trucks

Ericsson Manufacturing Co.

1184 Military Road
Buffalo, N. Y.

Berling Magneto

WORTH MORE DOES MORE

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Dealers Can Bank on a Sure, Steady Consistent Income

Any dealer who *is* a dealer can make a big success with the Dearborn One-Ton Truck Unit. No dealer need look far for all the good, live, practically sure Dearborn prospects he can take care of. Manufacturers, farmers, merchants, expressmen, lumber dealers, contractors, etc., in *your own locality* will buy the Dearborn One-Ton Truck Unit when you show them its remarkable economy and *unquestionable superiority.* Dearborn prospects will not pay $1500—the ordinary market price for a one-ton truck—the Dearborn Truck Unit (costing $350) combined with a Ford chassis, makes this unnecessary. The Dearborn gives all the service and is more economical to operate than any $1500 one-ton truck. It costs less to operate than a team and wagon and does four times the work. There is also a large field for Dearborn sales among big truck fleet owners.

$350 and a Ford, New or Old, Make a

FORD-DEARBORN One-Ton Truck

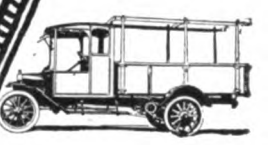
There isn't a weak point about the Dearborn Truck Unit. It is durable, sturdy, honest—every ounce of it. We guarantee its superiority. The Dearborn Truck Company is an established *manufacturing* concern—*not* a stock selling organization.

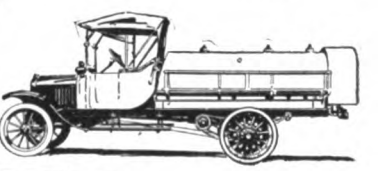
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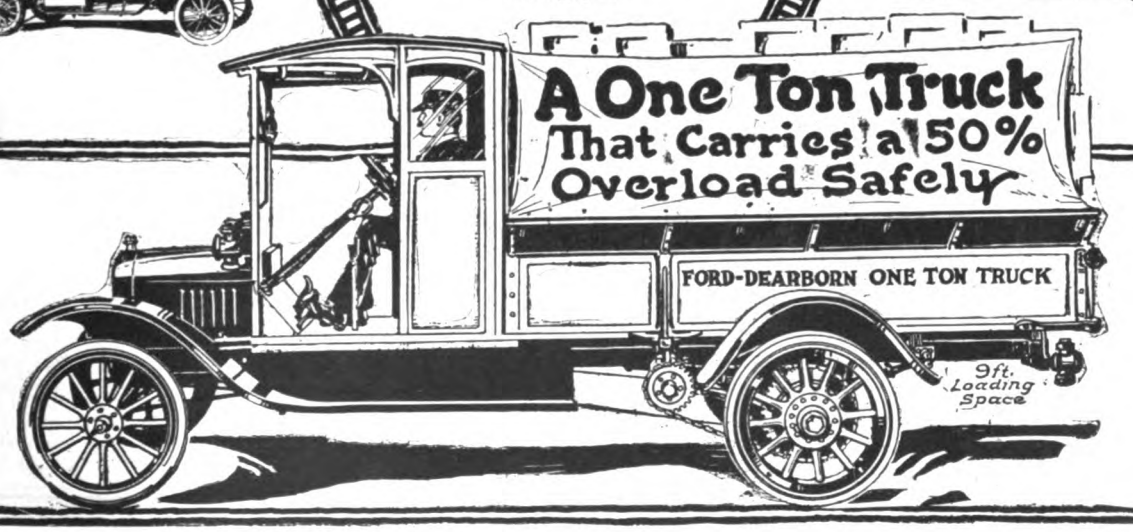
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A One Ton Truck That Carries a 150% Overload Safely



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"Patent Pending"

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These wheels were designed by, and are built under the supervision of, experienced engineers. They have been thoroughly tested and have proved they will stand hard usage and abuse.

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SATISFACTION GUARANTEED

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DOUBLE end steering device of original design makes it not only possible but EASY to back trailer anywhere. Double swiveled tongue; no other trailer has it.

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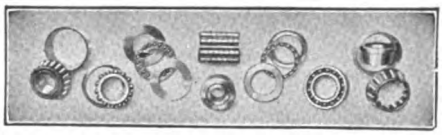
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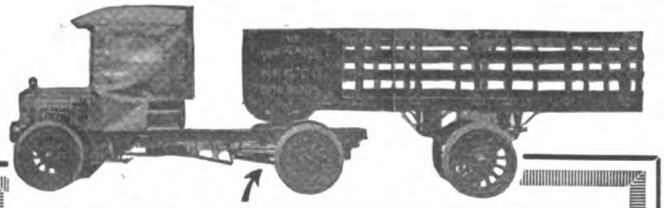


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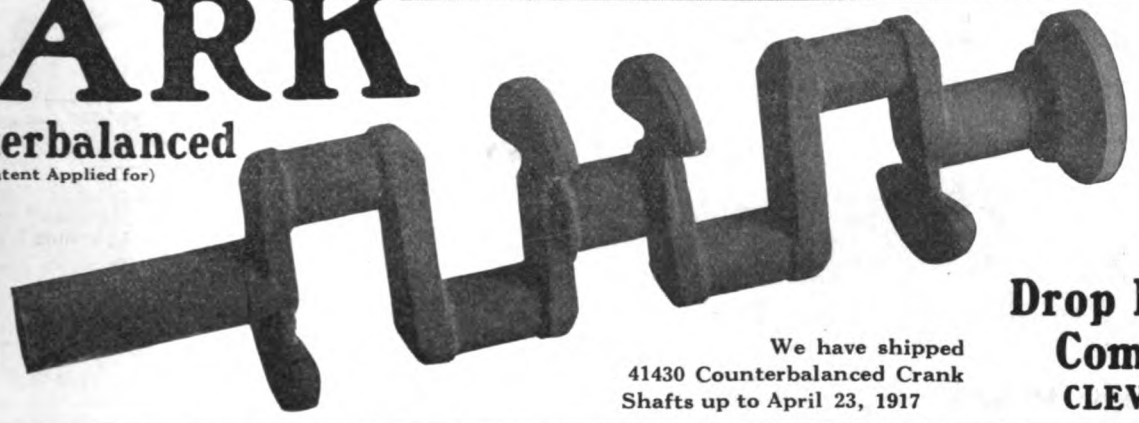
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(Patent Applied for)



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Shafts up to April 23, 1917

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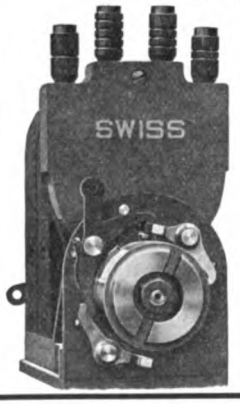
The Two Ton Worm Drive

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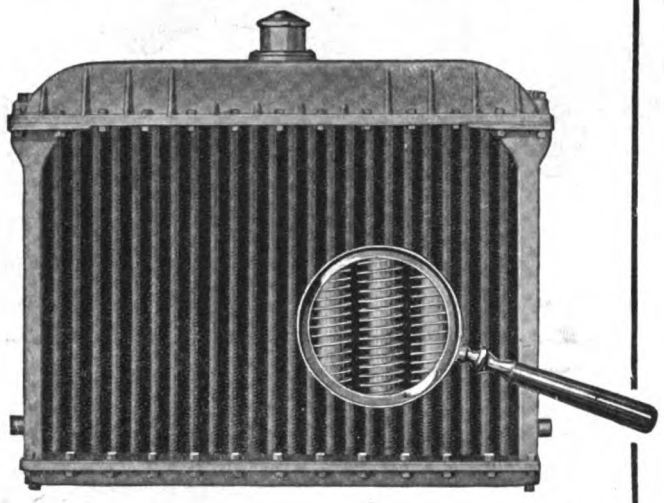
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The Champion Machine & Forge Co.
CLEVELAND, OHIO

Philadelphia Office: Bourse Bldg.
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Helical Tube Construction is Accepted as the Best by the Leading Truck Makers of America

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LYCOMING MOTORS

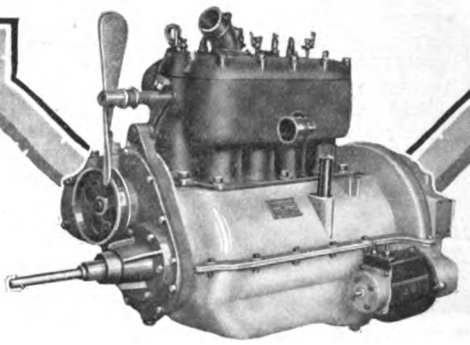
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Manufacturers of
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¾ Ton 1 Ton 1½ Ton 2 Ton 3 to 3½ Ton

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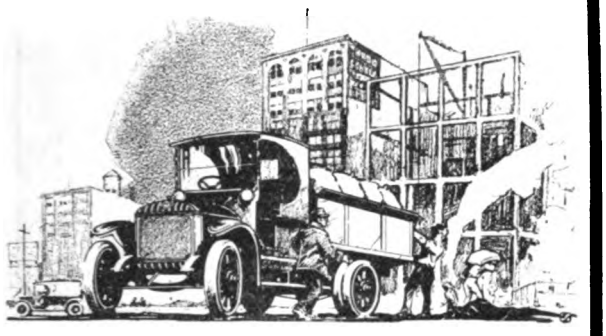
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Chicago, Ill.

5 MODELS — 1 Ton, 1½ Ton, 2 Ton,
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"WHITNEY" Chains
ARE BUILT FOR STRAINS



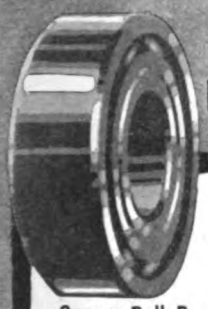
We have recently completed another large addition to our factory in order to be of service to our customers and are now in position to make prompt deliveries on most sizes of roller chains.

Whitney Chains are strong, accurate and dependable. They are used by the leading makers of trucks throughout the country.

Insist on "Whitney" Chains when making replacements.

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GURNEY
BALL BEARING

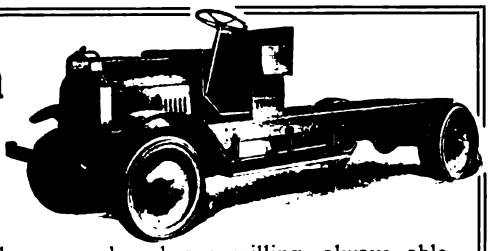


Simplify your Worm Drive

Get rid of those troublesome thrust bearings by using Gurney Radio-Thrust Bearings. They carry both radial and thrust loads on a single row of balls. Write for Bulletin A-2. 152

Gurney Ball Bearing Co. Chicago—Jamestown, N. Y.—New York
Conrad Patent Licensee

Lamson Trucks

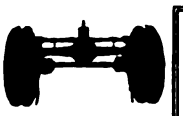


—worm drive—built large and sturdy for severe service—always ready—always willing—always able to deliver the load wherever a motor truck can go. Made in 5 sizes—1 to 5 ton—all oversize jobs.

Write for Catalog, prices, etc.

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Best axles use Thermoid Brake Lining


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American


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Empire

Judge a brake lining by its users.

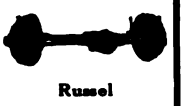
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Columbia
Peru
Sheldon
Russel
Celfor
Empire
Hess
American
Torbensen

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Chicago / / / Illinois

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It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault-type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

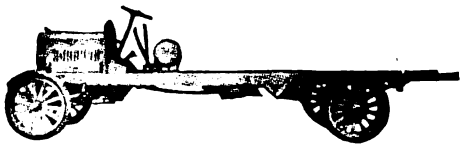
Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.

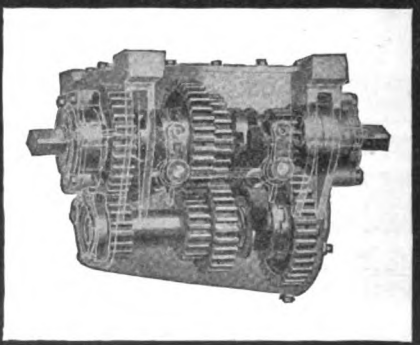
KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.

Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.



COTTA TRANSMISSIONS



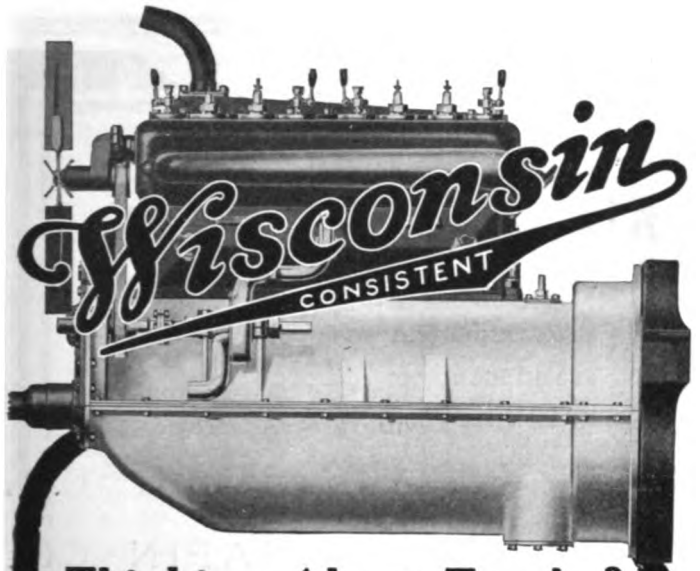
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ROCKFORD

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

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Thinking About Trucks?

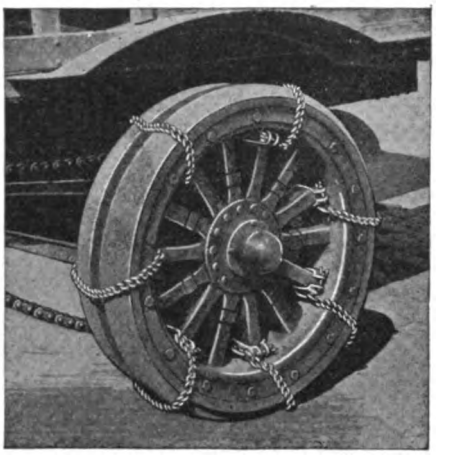
If you are, you're thinking about motors—wondering which one will stand up best under the tests your work will put it to. Men who know motors will tell you there's dependable quality in Wisconsin Consistent Motors that keeps them on the job, working at full efficiency.

Motors for pleasure cars, trucks and tractors. Write for specifications.

Wisconsin Motor Mfg. Co.

Sta. A-Dept. 319 Milwaukee, Wis.

New York Branch: 21 Park Row, T. M. Fenner, Factory Representative.
Pacific Coast Distributors: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles Co., Los Angeles, Cal.



Prest-O-Grip Anti-Skid Chains

(For Solid Tires)

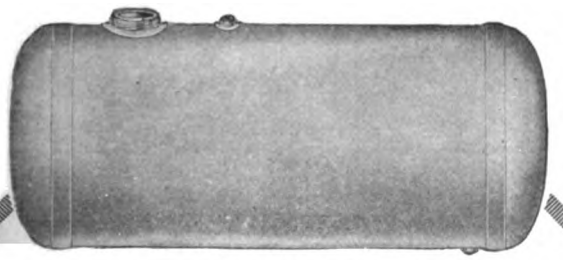
Prest-O-Grips attach to the wheel in a few moments without jacking up the truck. They do not have to be unraveled. Should one chain break, the wheel is still skid proof and there are no broken parts to injure the fenders.

The Prest-O-Grip Clamp is allowed to stay on the wheel. Chains with the patent lock link are ready for instant attachment. The lock link absolutely cannot accidentally open.

Prest-O-Grips are made in every size for every truck. Let us explain how you can at low cost insure your trucks against accident.

The Rowe Calk Company, Plantsville, Conn.

TRAGESER TANKS



GUARANTEED

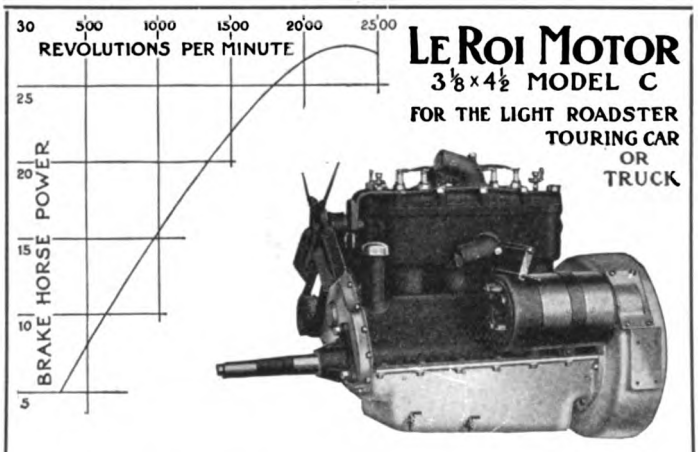
These tanks are made of No. 16 gauge steel, are tinned inside and outside by the hot process, guaranteeing a perfect coating. The seams are welded. The filler cap and outlets are all brass, insuring a tank that will outlast the car.

Made in all sizes.

Write for catalogue.

John Trageser Steam Copper Works

447-457 West 26th Street NEW YORK CITY



LE ROI MOTOR

3⅛×4½ MODEL C

FOR THE LIGHT ROADSTER TOURING CAR OR TRUCK

Used by leading manufacturers of best-known American-made light trucks.

The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

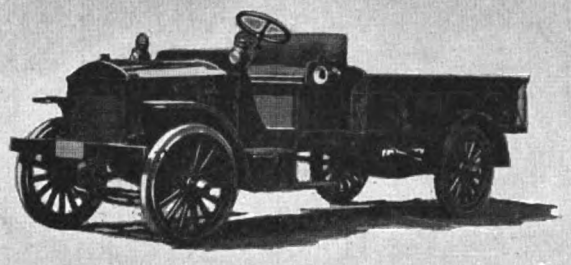
Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

CABLE LE ROI MILWAUKEE

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The GLOBE Truck
The Motor Truck PLUS



Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

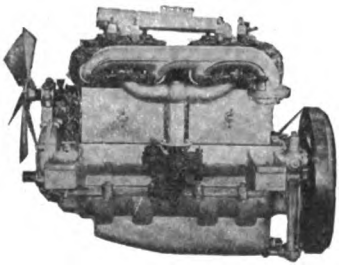
Globe Motor Truck Co.
721 Wright Bldg. St. Louis, Mo.

BROWN-LIPE

transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

BROWN-LIPE GEAR CO.
SYRACUSE, N. Y., U. S. A.
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Differentials Transmissions

NEW YORK—Thos. J. Wetzel, 29 West 42d St.
SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C.



Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications.

BEAVER MFG. COMPANY
Milwaukee Wisconsin

STEGEMAN 6 TRUCKS
SIX CYLINDER

THE ONLY SIX CYLINDER



THE Stegeman is the only line of Trucks powered with a Six Cylinder Motor. This is the most sweeping development in the Truck Industry. A year's continuous tests have demonstrated the Stegeman Six Cylinder undisputed Master of the Truck situation—both as to economy and endurance.

Agencies Go Quickly

Because Stegeman Six Cylinder trucks with electric starter furnish a string of argument that clinch sales and back competition clean off the board.

Sizes 2, 3, 4, 5 and 7 Ton

Stegeman Motor Car Co. Milwaukee

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SERVICE

under the hardest possible working conditions has proven

Evans Model "Hele-Shaw" Clutch
(Patented)



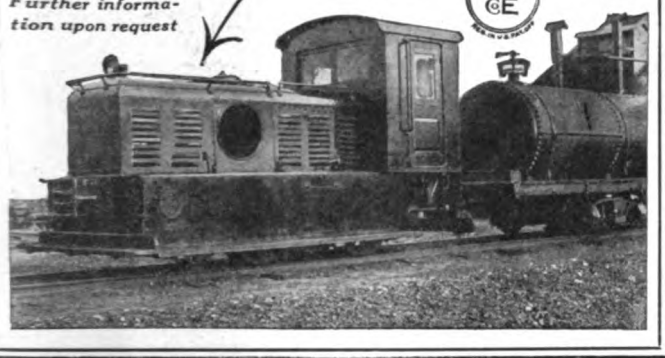
to be the best clutch for the severest requirements of motor truck service. They are standard equipment on all Gasoline Locomotives manufactured by the Baldwin Locomotive Works, Four Wheel Drive and Sterling Trucks and many others.

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Further information upon request



MONARCH

LIMITS THE SPEED AND THE EXPENSE



A Dependable GOVERNOR

The Monarch is the only Governor designed solely for internal combustion engines.

It checks excessive speeding—prevents the greatest of all truck abuses.

It limits the speed without limiting the power. Both automatic and manual control is through the Monarch Governor throttle—the carburetor throttle being removed. Throttle can't be wedged open.

The owner holds the padlock key and no readjustment can be made without his knowledge.

Write us today about a 30-day trial on your truck.

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520 Bethune Avenue West, Detroit, Mich.

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"The Highest Priced Tires in America"

Your truck will

last longer
ride easier
skid less and
require fewer repairs

if equipped with Polack Tyres.

Polack European Standard Tyres are guaranteed 10,000 easy riding miles—and invariably exceed the guarantee.

Truck manufacturers are glad to supply Polacks **if specified by you** because their use redounds to the credit of the truck.

Polack European Standard (high profile), "the highest priced tire in America," insures a **less cost per mile** because of its distinctive quality, size and guarantee—any way you care to figure it.

Manufacturers will equip with Polack **SAE** Tires, same **quality** but less **volume,** at no extra cost.

Polack Tyre & Rubber Co.

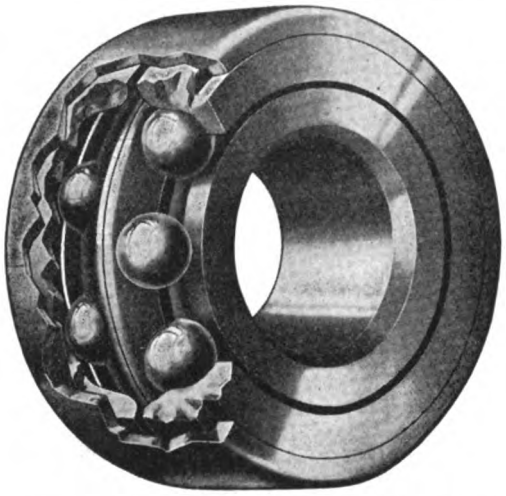
1876 Broadway **NEW YORK CITY**

Branches and Service Stations in All Principal Cities



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First—
Foremost—
Fittest—



The unprecedented success of the New Departure Double Row ball bearing is evinced by the effort of other manufacturers to approximate its design and efficiency.

The idea of combining in a single self-contained unit the ability to resist all thrusts and radial loads has been accepted because of its practicability and economy.

The practice of mounting three separate bearings together to resist these same combined thrusts and radial loads is fast being superseded everywhere by the more simple, economical, satisfactory, easily installed New Departure Double Row.

As pioneer in this field the New Departure has important patented features which place it in advance of any anti-friction bearing yet produced.

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THE NEW DEPARTURE MFG. CO.
Bristol, Conn. 818-20 Ford Building, Detroit.

NEW DEPARTURE BALL BEARINGS

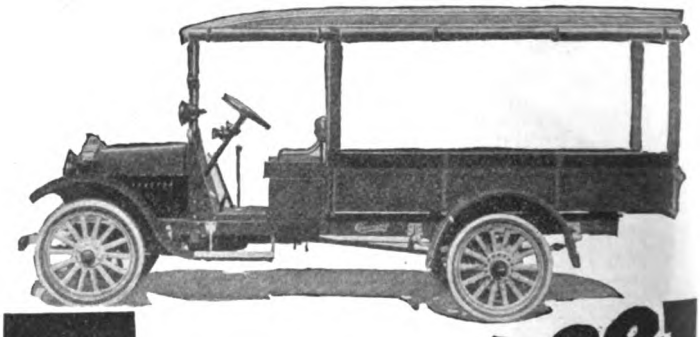
Firestone
Giant Truck Tires

A Giant of Business

THE Firestone Giant Truck Tire is a giant tire for a giant business. The Firestone Giant is the largest truck tire made. Tests of service have proved this Firestone Giant to be more economical and more efficient than dual equipment. Call at Firestone branch or write us today for full information.

FIRESTONE TIRE AND RUBBER COMPANY, AKRON, OHIO
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Commerce
TRUCKS
1 TON CAP

A Year Ahead *of* Other Trucks

The only truck having everything necessary on it—when you buy it

Three types of bodies for all models—Remy Starting and Lighting—Stewart Vacuum System—Pierce Governor—Windshield—Bumper.

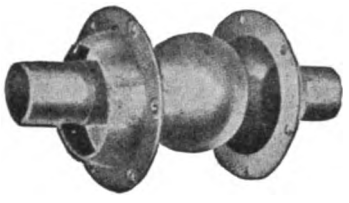
Continental Motor—Torbensen Rear Axle—Detroit Steel Products Company Springs. Price—$1250 f.o.b. Detroit.

The Commerce Motor Car Company
DETROIT MICHIGAN

W. H. Brinkerhoff, Eastern Dist. Mgr.
Belmont Ave., Elmhurst, Long Island, N. Y.

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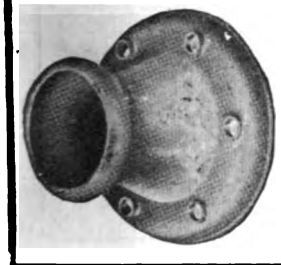
BOSSERT



In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice. We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, axle housings, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

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stands for the prompt delivery of your order filled in accordance with every item of the specifications.



THE BOSSERT CORPORATION
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BEST FOR HEAVY DUTY

Dealers who are awake to the possibilities in the motor truck field are today pushing a line of heavy-duty trucks. United Trucks are designed essentially for heavy-duty service. They have the strength, power and endurance for the hardest kind of work. On account of their superior performance, dealers find United Trucks easy to sell —and they STAY SOLD. Made in 2, 3½, 4 and 5-ton sizes, all worm drive. Get our interesting dealers' proposition.

UNITED MOTORS CO.,
672 North St., Grand Rapids, Mich.

United Trucks

THE MARK OF A BETTER RADIATOR

G & O Radiators for Heavy Duty Service

The G & O Mfg. Co.
New Haven Connecticut

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DENBY
TRUCKS
FOR TRAIL OR PAVEMENT

THERE's an old proverb that says: "Actions speak louder than words." It's a good rule to apply to motor-trucks, in this day of a multiplicity of conflicting claims.

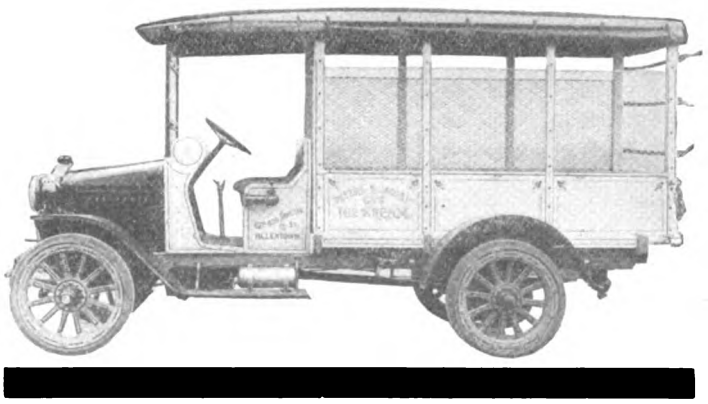
Denby trucks have back of them years of satisfactory service in scores of business fields. They are in use today in mountainous —sometimes roadless—sections hitherto regarded as the last stronghold of the horse or the pack-mule.

And whether in the outposts of civilization or in city service, the internal-gear driven Denby is stamping itself as a thoroughbred, and earning the owner's enthusiastic "well-done."

Denby prestige is an asset of the greatest value to the dealer. For it means that the truck-buyer gives to the Denby the most careful consideration in making his choice.

We are always glad to hear from progressive dealers who appreciate the wonderful possibilties of the motor-truck business.

Denby Motor Truck Company
Dept. K, Detroit, Michigan



Veeder Hub Odometer

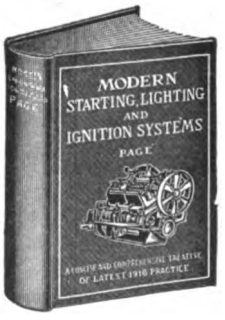
—the mileage recorder that should be on *your* truck. For it is the accurate mileage recorder —registering every mile traveled both backward and forward and with unerring exactness, for in it are the best efforts of the Veeder Mfg. Co.—the world's largest manufacturers of counters.

You should audit your truck expense by means of a Veeder Counter and bills. With your accurate mileage and your exact costs you can *know* your delivery costs and where you are not getting the service you should. Do you get it from your tires, your gasoline, etc.? Do *you* know? Ask a Veeder Hub Odometer.

Price complete $20. Special Model for Ford Cars $15.

Cyclometers for Bicycles and Motorcycles. Odometers for Automobiles and Horse-drawn Vehicles. Counters for practically every purpose. Tachometers, Tachodometers and Fine Die Castings.

VEEDER MFG. CO.
54 Sargeant St., Hartford, Conn.
New York Representative
Joseph T. Quinlan, 1777 B'way
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C. G. Wirick Co., 617-619 Fulton St.



MODERN STARTING, LIGHTING AND IGNITION SYSTEMS

By Victor W. Page, M.E.

250 Specially Made Engravings. Nearly 400 (5½ x 8) Pages. Folding Plates.

A Self-Educator on Electrical Systems. All the leading systems of Starting, Lighting and Ignition have been described and illustrated with the co-operation of the experts employed by the manufacturers. Wiring diagrams are shown in both technical and non-technical forms. All symbols are fully explained. This is a book of real merit.

Commercial Vehicle
241 W. 39th St., New York

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The COMMERCIAL VEHICLE

THE editorial policy of COMMERCIAL VEHICLE interests the truck owner by keeping him advised of all new developments in the quest for the ultimate lowest-ton-mile-haulage.

It interests the Truck and Accessory Dealers by advising them of the newest and most valuable way and means for increasing sales and efficiently managing their business.

READERS

5,000 (plus) interested readers subscribers—read COMMERCIAL VEHICLE twice every month.

Most of them are just as much interested in the advertisements as in the editorial matter.

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This circulation is guaranteed—you **know** that the very people you want to reach will read your story. You have practically 100% of actual prospects.

COMMERCIAL VEHICLE is definitely and permanently established with the trade and offers a medium to advertisers in this particular field that is unexcelled.

It offers a dollar-for-dollar value that is extremely attractive to advertisers

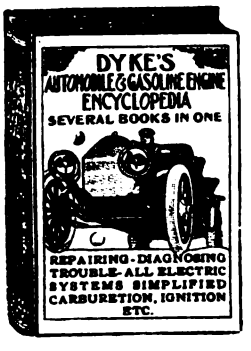
The COMMERCIAL VEHICLE

239 West 39th Street New York

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Mechanical Instruction Books
For the Dealer

DYKE'S AUTOMOBILE and GASOLINE ENGINE ENCYCLOPEDIA



5TH EDITION—JUST OUT

A teacher, guide and reference on everything pertaining to motoring—simple as the A-B-C's.

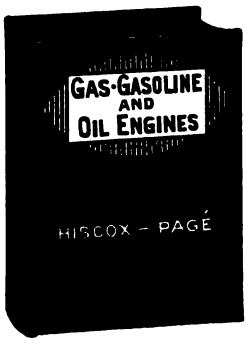
It's worth ten times its cost, if only placed on the shelf and used as a reference.

2370 Illustrations. 824 Pages. 50 Instructions.

Price, $3.00. (Add 25c. to prepay.)

Free—with encyclopedia—a supplement treating on the FORD, PACKARD & KING—part printed in two colors.

GAS, GASOLINE and OIL ENGINES



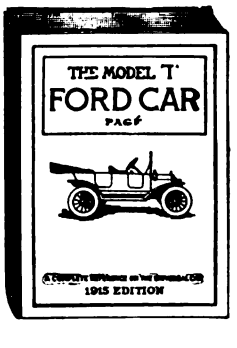
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By Gardner D. Hiscox, M.E.

By Victor W. Pagé, M.E.

Enlarged and Entirely New Edition of this Standard Work, Considers exhaustively all Types of Stationary, Marine, Motor Vehicles and Aerial Power Plants. 640 PAGES, With Folding Plates—435 ILLUSTRATIONS. Price, $2.50 Net.

THE MODEL T FORD CAR



Its Construction, Operation and Repair

By Victor W. Pagé.

300 (5 x 7) pages. Over 100 specially made engravings and two large folding plates.

Price, $1.00

This book is written for FORD DRIVERS and OWNERS, by a recognized automobile engineering authority and an expert on the FORD, who has driven and repaired Ford Cars for a number of years. He writes for the average man in a practical way from actual knowledge. All parts of the Ford Model T Car are described. ALL REPAIR PROCESSES ILLUSTRATED AND FULLY EXPLAINED.

Book Department THE COMMERCIAL VEHICLE 241 W. 39th St., N. Y. C.

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A TRAILER or Semi-Trailer for every hauling job, for every load, for every business, for every user, for every dealer.

Greatest speed in loading and unloading. Greatest stability. Greatest flexibility. For every type of tractor, motor truck, traction engine, or road roller, single or in train.

The only Bottom Dump Trailers and Semi-Trailers on the market.

Bottom Dump Trailers, 54 to 120 cubic foot capacity.

Bottom Dump Semi-Trailers, 81 to 120 cubic foot capacity.

Platform Trailers, 2 to 5 tons capacity.

Platform Semi-Trailers, 3 to 5 tons capacity.

Watson Trailer Chassis for Special Bodies, 3 to 10 tons capacity.

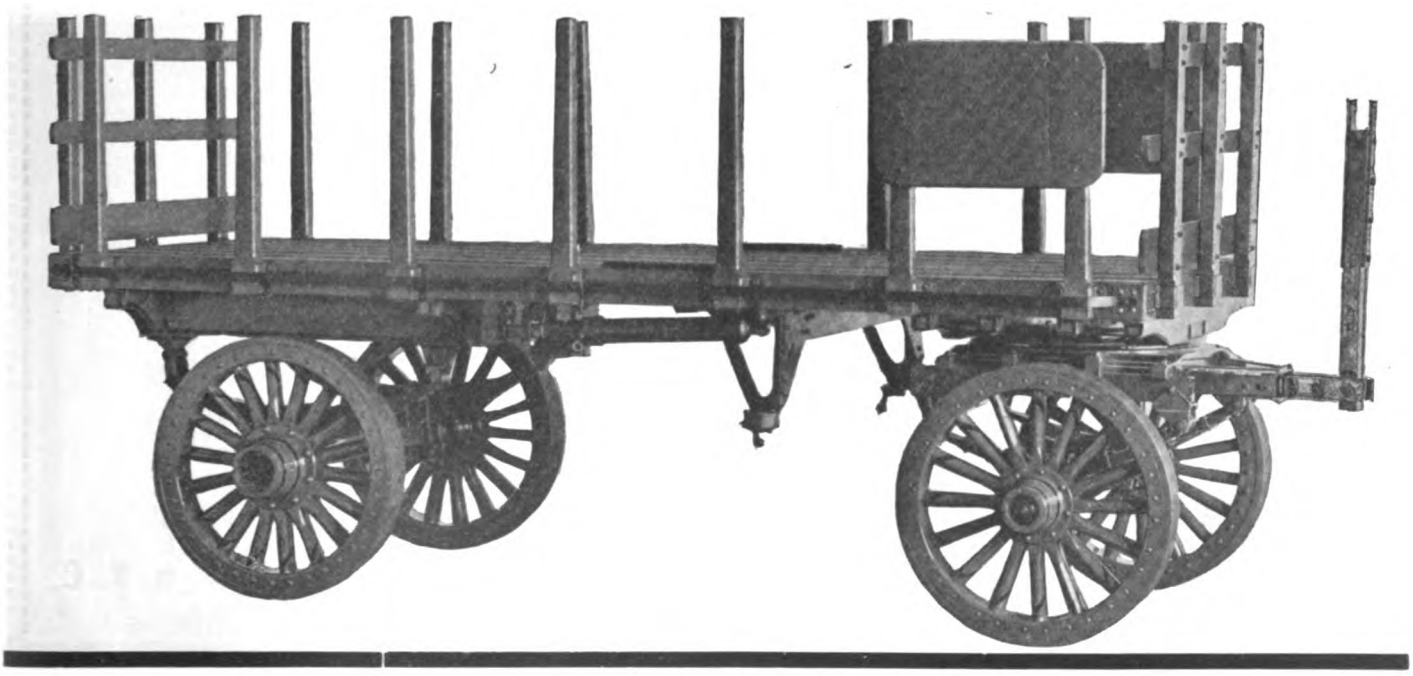
Optional equipment of steel or rubber tires.

All built and backed by the Watson Wagon Company, specialists for over 30 years in heavy hauling equipment and **the largest manufacturers of Bottom Dump Wagons in the world.**

Every dealer will appreciate the significance of this statement. In territories still unrepresented big Trailer sales are waiting to be gathered in by dealers big enough to handle big propositions. Wire or write TODAY for our generous Selling Plan, territorial allotment, etc. Also ask for special Watson Trailer and Semi-Trailer literature.

WATSON WAGON COMPANY

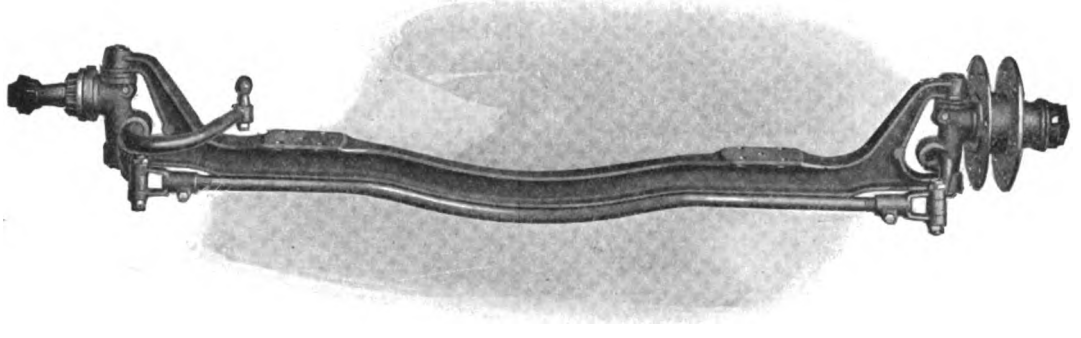
28 West Center Street **Canastota, N. Y.**



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COLUMBIA
AXLES
FRONT AXLES for MOTOR TRUCKS



DESIGNED and constructed as **Truck** Axles to withstand the severe service and abuse encountered in commercial deliveries—and endowed with a wide margin of overload capacity. I-Beam forgings, double heat-treated; chrome-nickel Spindles and Steering Arms; two heavy duty roller bearings in each hub.

Made in Three Sizes for

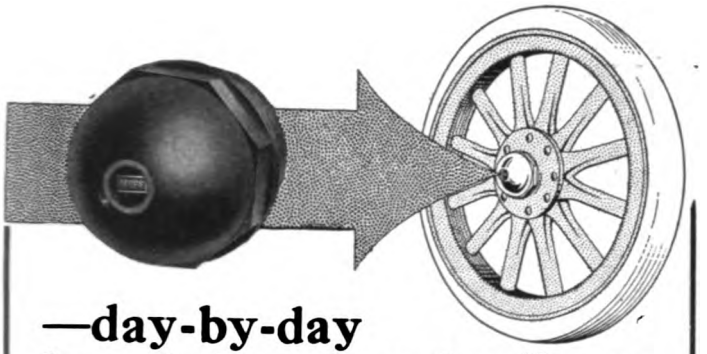
½-ton Trucks—¾- to 1-ton Trucks—2 to 2½-ton Trucks

Built with the same degree of careful attention and following the same general principles of construction that have won unqualified approval for Columbia Pleasure Car Axles. We are still able to make

Prompt Deliveries

THE COLUMBIA AXLE COMPANY
Cleveland, Ohio

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—day-by-day knowledge of truck mileage

keeps you posted as to what your trucks are doing, and makes it possible for you to eliminate waste in mileage, economize your driver's time, and cuts your tire, gasoline and oil bills to the quick.

Trade **DREADNAUGHT** *Indestructible* Mark
Hub Odometer

means lower cost per productive truck mile. And it means less operating expense and less capital per truck mile. The dreadnaught puts it up to the driver to save you money—see that he does it.

Figures always right side up—easy to read. Guaranteed indestructible—we will give you a new one if you break it.

Write for booklet and prices

AMERICAN TAXIMETER COMPANY
Manufacturers of Jones & Popp Taximeters
1765 Broadway **NEW YORK CITY**

Standard

MADE IN DETROIT USA

Motor Trucks

Startled the Motor Truck Industry By a Unique Sales Plan

First of all, the Standard is an unusual truck. It is a powerful combination of many of the best-known units manufactured — parts that are considered the standard the world over.

The Standard Motor Truck is sold in an unusual way. Costs you nothing to learn of the Standard Selling Plan. It is the most liberal ever made.

Write for details of this plan. No obligation

Standard Motor Truck Co. 315-327 Bellevue Ave. Detroit, Mich.



NEVER-LEAK
Copper Asbestos-Filled
GASKETS

Get your estimate on your next gasket requirements. You will be agreeably surprised.

For producing absolutely gas-tight joints nothing has ever been invented to compare with Never-Leak Gaskets. You can protect yourself from all worries over compression leaks if you fully equip your motor with these Copper Asbestos-Filled Gaskets.

The copper gives malleable metal contact surfaces. The asbestos secures a body which retains a powerful spring under compression.

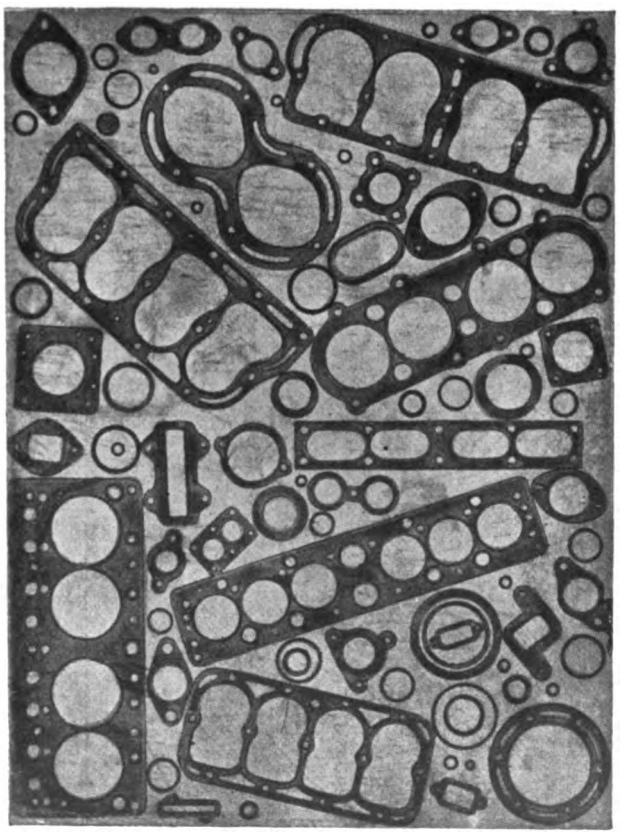
If you have gasket trouble of any nature consult our Engineering Force. This will involve you in no obligation or expense.

Write for our estimates. We are equipped with many thousand special dies such as here shown and can readily produce the gaskets you need.

Have "Never-Leak" on every gasket.

The Fitzgerald Mfg. Co.
TORRINGTON, CONN.

Gasket Dept.



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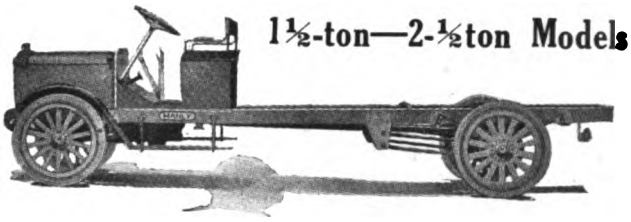
Heavy Duty Truck Frames

Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

Added capacities together with latest type equipment enables our assuring you of satisfactory service.

Our engineers are at your service, and we solicit your inquiries.

DRIGGS-SEABURY ORDNANCE COMPANY
SHARON, PENNA.



America's New Quality Truck Has 20 Remarkable Features—

features proven in the fire-test of actual service to be of money-saving merit to users and sales creative value to dealers. These set MANLY Trucks in a class far up among quality commercial vehicles.

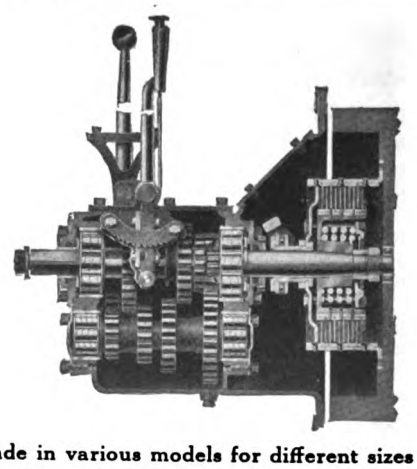
MANLY
TRUCKS

Wire or write for advance information or visit our factory. Handsomely illustrated catalog sent on postal request.

Territorial arrangements now being made for early deliveries

MANLY MOTOR CORPORATION
WAUKEGAN ILLINOIS
1432 Michigan Avenue Chicago, Illinois

COVERT COVERT COVERT
TRANSMISSIONS



Made in various models for different sizes and types of cars—Covert Transmissions will free you from transmission troubles. Let us show you how they fit your construction.

Covert Gear Company, Inc.
Sales Office, Detroit, Mich.
Factory, Lockport, N. Y.

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MACCAR

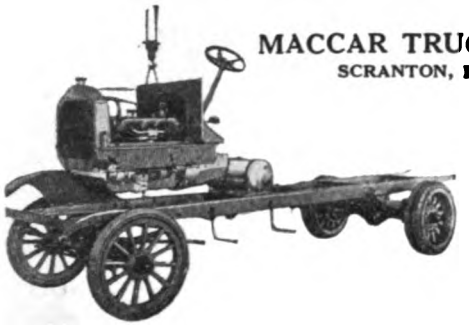
Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.

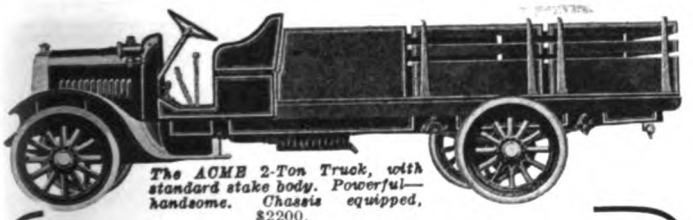
If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.

The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.

Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.



MACCAR TRUCK CO.
SCRANTON, PA.



The ACME 2-Ton Truck, with standard stake body. Powerful—handsome. Chassis equipped, $2200.

Fill Immediate ACME Orders!

DEALERS: Get the quick, profitable business of local truck buyers who know the advantages of ACME Trucks and want them for early delivery. The surest selling features to meet customers' requirements for from 1-ton to 3-ton capacities.

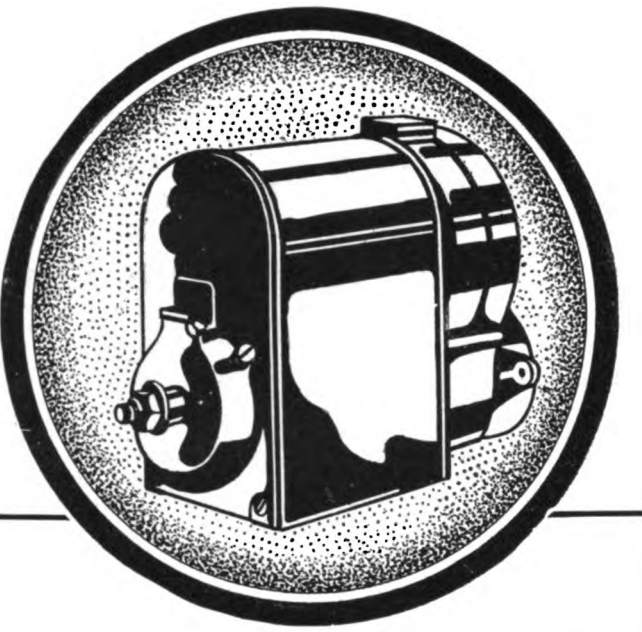
Clinch the ACME Agency now—and sell easily, with substantial profit. No large service to render because of fifteen famous "Proved Units" from radiator to tail light. ACMES have oversize dimensions. The 2-ton ACME has powerful 40 H. P. Continental Motor and big capacity—Chassis, equipped $2100.

ACME
THE TRUCK OF PROVED UNITS

Be in a position to accept big business on our One-Ton Truck. Announcement and specifications sent on request. An all-feature worm drive ACME —$1575.

Write for Booklet, "A Business Builder," and Territorial offer today. Or WIRE—

Cadillac Auto Truck Co.
14 Mitchell Street
CADILLAC, MICHIGAN



Character Witnesses for Eisemann

Motor Truck use is the hardest, therefore the best test of a Magneto.

Take the testimony of the Motor Truck Makers—by counting noses if you like; or, better still, by selecting the recognized leaders.

Among the 69 who use the Eisemann as standard equipment are

Federal	**Pierce-Arrow**
G. M. C.	**Service**
Gramm-Bernstein	**Sterling**
Kelly	**White**

Only one consideration could decide such leaders as these—not sentiment, not price, not salesmanship—efficiency!

THE EISEMANN MAGNETO CO.
Sales and General Offices:
32-33rd St., Brooklyn, N. Y.
Chicago, Ill., 910 So. Michigan Ave.
Detroit, Mich., 802 Woodward Ave.

EISEMANN
MAGNETO

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INDIAN—

A Truck Tire That Is Making a Reputation



No need to say otherwise—**Indian** IS a new motor truck tire. There are thousands of truck owners who haven't heard about the **Indian** yet, but they will before long simply because it is one of those tires that people can't stop talking about once they have watched its service under conditions that send the ordinary truck tire to the scrap heap in a short time. That's it—**Indian tires** are making a reputation.

The reason is simple. **Indian tires** are made to overcome the deficiencies of makes that have gone before. Quality, strength, endurance—all these are present in the highest degree of perfection. The guarantee, liberal though it is, falls far short of the actual service obtained from the tire itself. It will pay you to investigate the **Indian**.

INDIAN TIRE & RUBBER CO.

New Brunswick **NEW JERSEY**

Mack

TRUCKS

MACK

trucks make good under the most difficult road and hauling conditions. Over 7000 in daily operation give practical demonstration of *Mack* superiority.

Built in capacities from 1 to 7½ tons.

"Performance Counts"

INTERNATIONAL MOTOR CO., NEW YORK

64th Street and West End Avenue



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International Motor Trucks

Standard 1917 Models



WE offer the 1917 models as sensible, economical assets to any growing business. The **International** satisfies experienced users — that proves its quality. One of them told us recently, "I don't see how you do it for the money. There is no better motor truck at any price." And he had owned and used trucks of the most expensive makes.

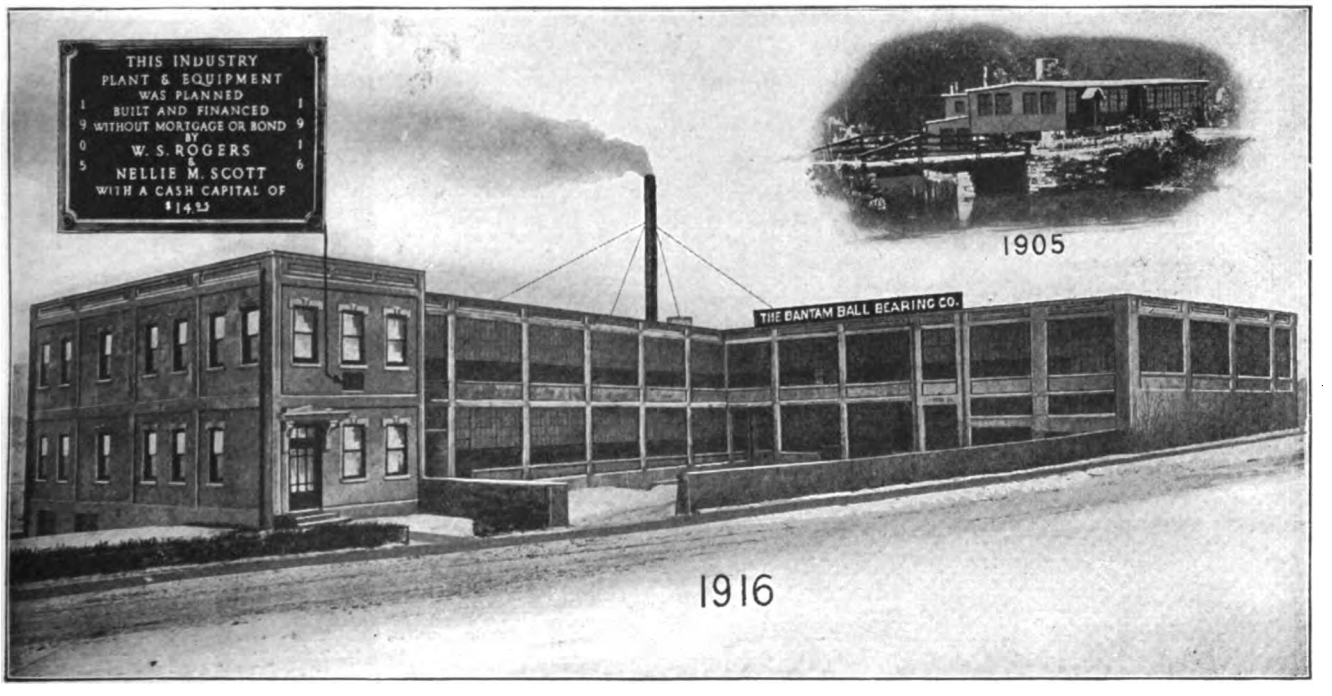
The **International** really is different. The truck is built, from engine to body, in one immense factory. It was designed by men experienced both in the building and use of motor trucks. The radiator is behind the engine. The engine is easy to get at. The truck has a double rear axle and internal gear drive. We say, and we mean it, that you can't buy a better truck at any price; nor can you buy one so good for less money.

One of these INTERNATIONAL models will meet your requirements: Model H chassis, 1500 pounds capacity, $1225; Model F chassis, 2000 pounds capacity, 128" wheelbase, $1500; Model F chassis, 146" wheelbase, $1550. Prices cash f.o.b. factory. Write us for detailed folders, and any particular information you need.

International Harvester Company *of* America
Incorporated

88 HARVESTER BUILDING CHICAGO U S A

WHAT CAUSED OUR GROWTH



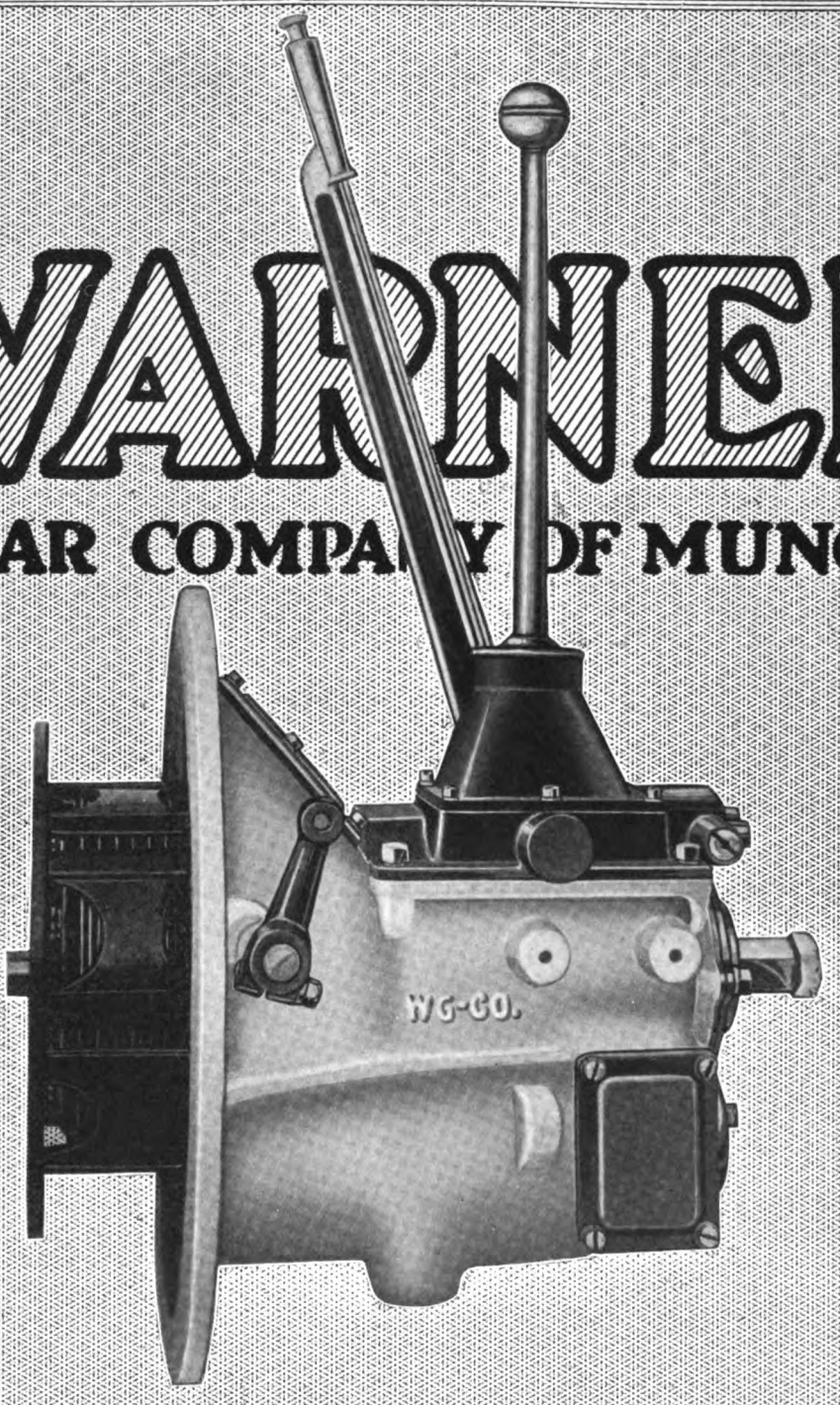
LOYAL, EFFICIENT SERVICE TO OUR CUSTOMERS

THE BANTAM BALL BEARING CO., BANTAM, CONN.

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WARNER

GEAR COMPANY OF MUNCIE



Warner Truck Transmissions

A Mark of High Quality and Long Service In Any Motor Truck

TRANSMISSIONS · CLUTCHES STEERING GEARS · DIFFERENTIALS

WARNER GEAR COMPANY, Muncie, Indiana

Detroit Office, 967 Woodward Ave.

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive $1095 | **Two-Ton Worm Drive $2200** | **Three-and-One-Half-Ton Worm Drive $3100**

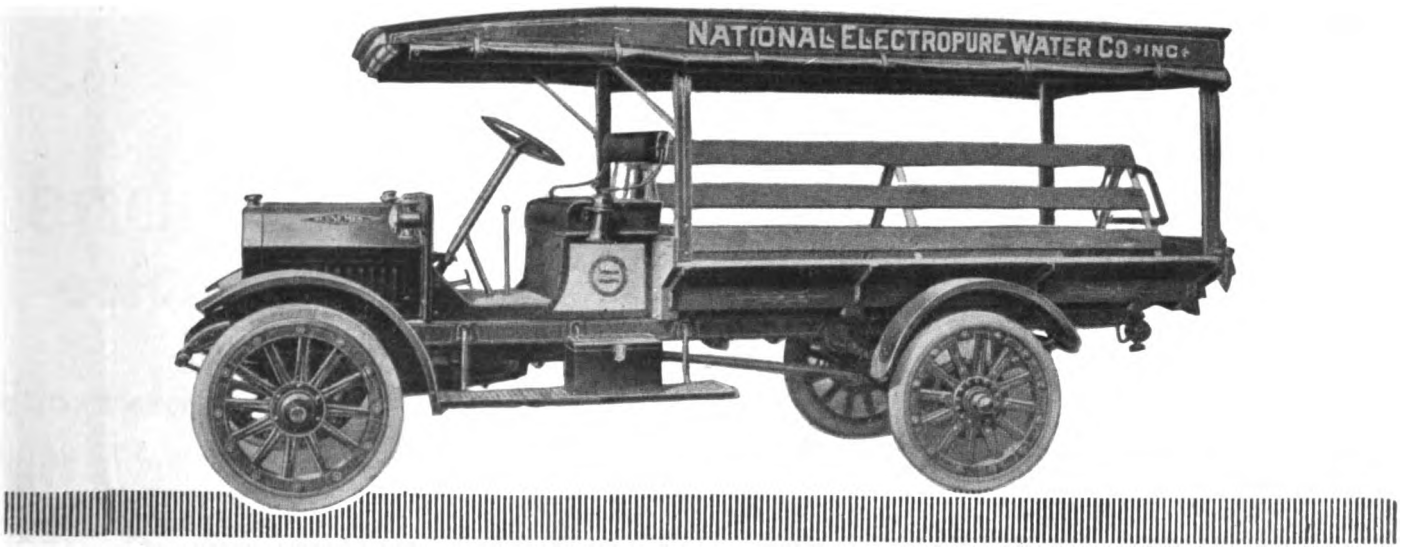
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

Bessemer Motor Truck Company **Grove City, Pa.**

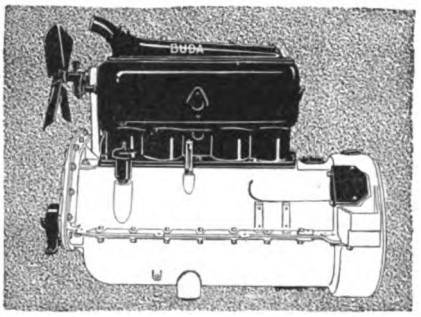
Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State



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"LET US HAVE THE FACTS"—No. 4



MEAN EFFECTIVE PRESSURE

A high mean effective pressure is the physical demonstration of correctness of motor design, materials used, and methods of manufacture. More pertinently, it is an unfailing guarantee that a motor is highly efficient, economical in operation and exceedingly flexible.

The BUDA MOTOR

has an unusually high M. E. P. You or your engineer can verify this fact by visiting the Buda plant and making your own close, technical examination. Buda torque and power curves indicate the results you may expect. Together with detailed specifications, etc., they are in the new truck motor catalog.

As a preliminary step write us for it.

THE BUDA COMPANY, HARVEY (Chicago Suburb) ILL.

THE BUDA COMPANY
BUDA
MOTOR
"The part to buy the car by"
ESTABLISHED 1881

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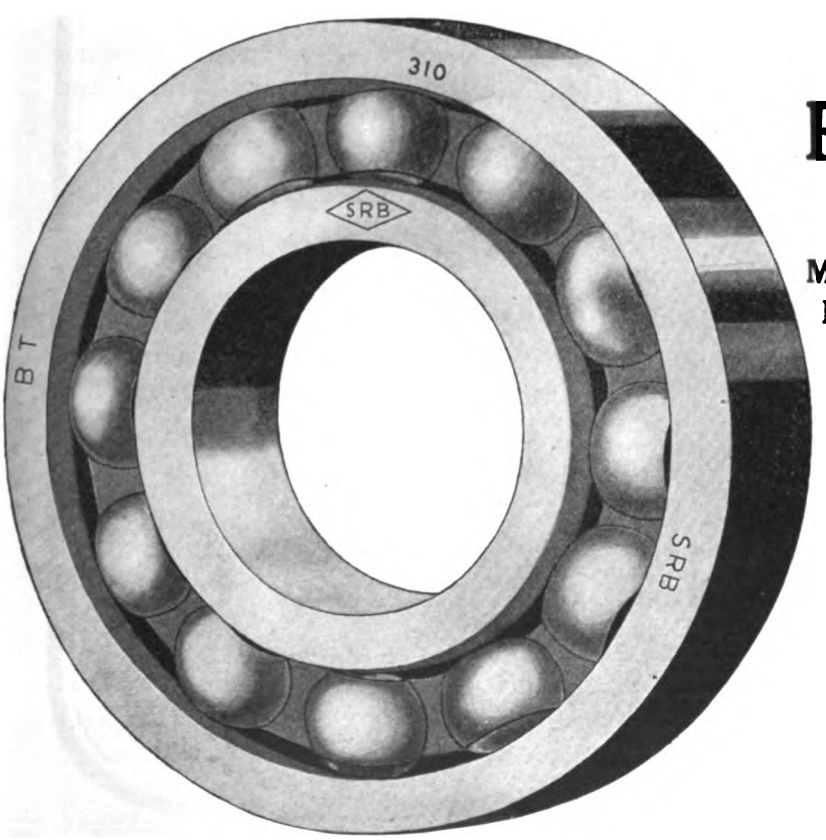
SRB

Sturdy Reliable Bearings

As pioneers in the manufacture of Bearings and Balls, and with the experience which results from long association and consequent overcoming of the difficulties arising in their development, we have finally succeeded in offering to the world our Standard Chrome Alloy Steel Bearings and Balls, which have strongly appealed to the progressive manufacturers, who place quality and workmanship above everything else.

Our business has grown in proportions far beyond our expectations, and the combination of letters which represent our product in the world's market is universally looked upon as indicating a product of distinction and one in which quality is carried out to the minutest detail.

Combined with the use of machinery designed by our able engineers, we have also embodied the most advanced and best accepted ideas of bearing and ball manufacture, so that we are now fully equipped to meet the demand for our products.



Standard Roller Bearing Co.

Philadelphia, Pa., U.S.A.

Makers of S.R.B. Annular Ball Bearings, Ball Thrust Bearings, Taper Roll Bearings, Steel Balls and *Rudge-Whitworth* Wire Wheels

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Announcing

"The Baby Wood"

HYDRAULIC HOIST

(TYPE "E")

—the lightest,
—the simplest,
—the most positive,
—the quickest-working

And the **most easily installed** dumping device made;

—the inevitable choice—therefore—of the 1917 buyer of light dumping equipment.

Expressly designed for trucks of 2-ton capacity; but equally adaptable to one and 3-tonners.

Supplied with new special model rear-dump body, forming an ideal combination for every manner of light hauling and dumping.

Weight approximately 250 lb.; requires a space of only 13½ inches between body and seat; body arms are outside of chassis frame.

Made to fit any chassis.

With production about to begin on this new model and every indication of a nation-wide demand, we again recommend that prospective buyers of this type of equipment communicate without delay.

Particulars upon request. Address all inquiries to Detroit.

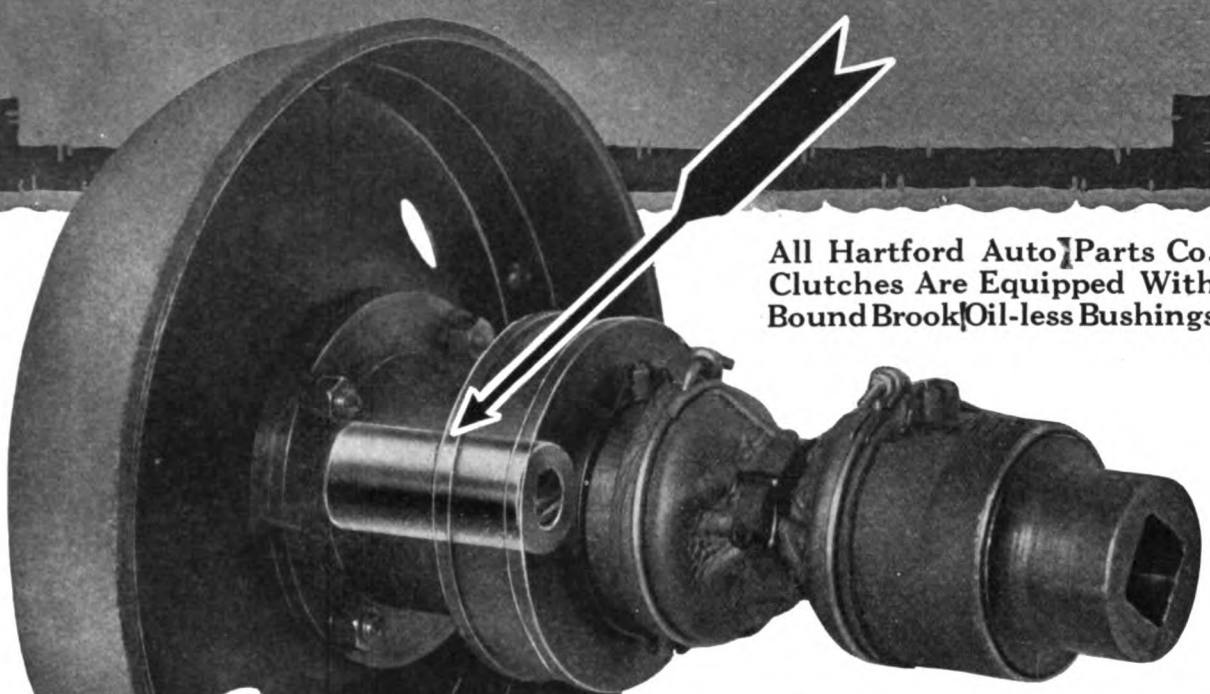
Wood Hydraulic Hoist and Body Co.

Sole Manufacturers

NEW YORK **DETROIT** CHICAGO

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In The Clutch



All Hartford Auto Parts Co. Clutches Are Equipped With Bound Brook Oil-less Bushings

BOUND BROOK

TRADE MARK REG. U. S. PAT. OFF.

Oil-Less Bushings

Hard, rough, constant service is the certain fate of clutch bushings.

Efficient lubrication is their only hope for a long life of service.

But being inaccessibly located they are difficult to lubricate and are usually neglected.

Therefore, many clutch manufacturers use "BOUND BROOK" (*Graphite-and-Bronze*) Oil-less Bushings—just as these bushings are used all over the country in pleasure cars, trucks, submarines and aeroplanes—and all kinds of other machinery—where self-lubricated bushings are essential.

BOUND BROOK Graphite and Bronze Oil-less Bushings require less lubricating attention to give efficient service.

Oil does not harm these trouble-less bushings.

Made of finest bearing bronze, so constructed as to retain our special lubricating graphite. Bound Brook Bushings have made a record for long life and perfect service under all conditions that is absolutely unapproached by ordinary bushings.

They spell ECONOMY and EFFICIENCY in capital letters, as all who use them testify.

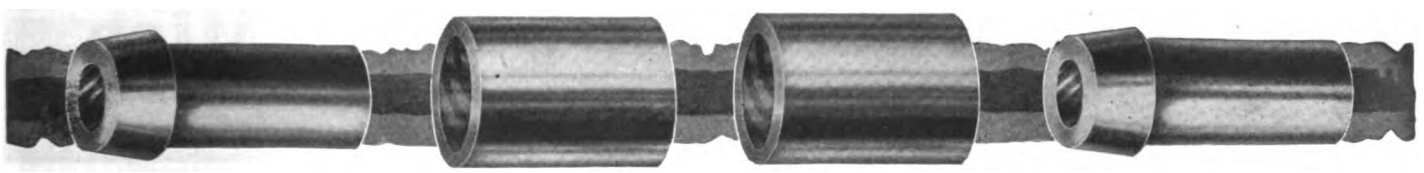
We also manufacture "NIGRUM" (*Impregnated Wood*) Oil-less Bushings.

All genuine Graphited Oil-less Bushings have always been made at Bound Brook, U. S. A.

BOUND BROOK OIL-LESS BEARING COMPANY

Specialists in the manufacture of Oil-less Bearings for more than a Third of a Century

BOUND BROOK NEW JERSEY



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AS CONSTANT AS NIAGARA



The Recognized STANDARD

for

MOTOR CARS
MOTOR TRUCKS
AND TRACTORS

Upon request, we will send our Engineering Experts to help solve your problems.

LONG MFG. CO., Detroit, Mich.

Pioneer Makers of Gasoline Engine Cooling Systems

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KISSELKAR TRUCKS

The final choice of purchasing experts in over 200 different lines of business.

The matchless Kissel-built motor, and perfected worm drive rear axle, are guaranteed with every KisselKar Truck.

Six sizes from the 1500 lb. Delivery up. Chassis prices $1085 to $3750.

KisselKar Truck branches, display rooms and service stations in all principal cities and towns.

KISSEL BUILT-IN STRENGTH—IN FRAMES, AXLES, SPRINGS, BRAKES, MOTOR AND OTHER STRUCTURAL PARTS—INSURES CONTINUOUS PERFORMANCE AT ALL TIMES.

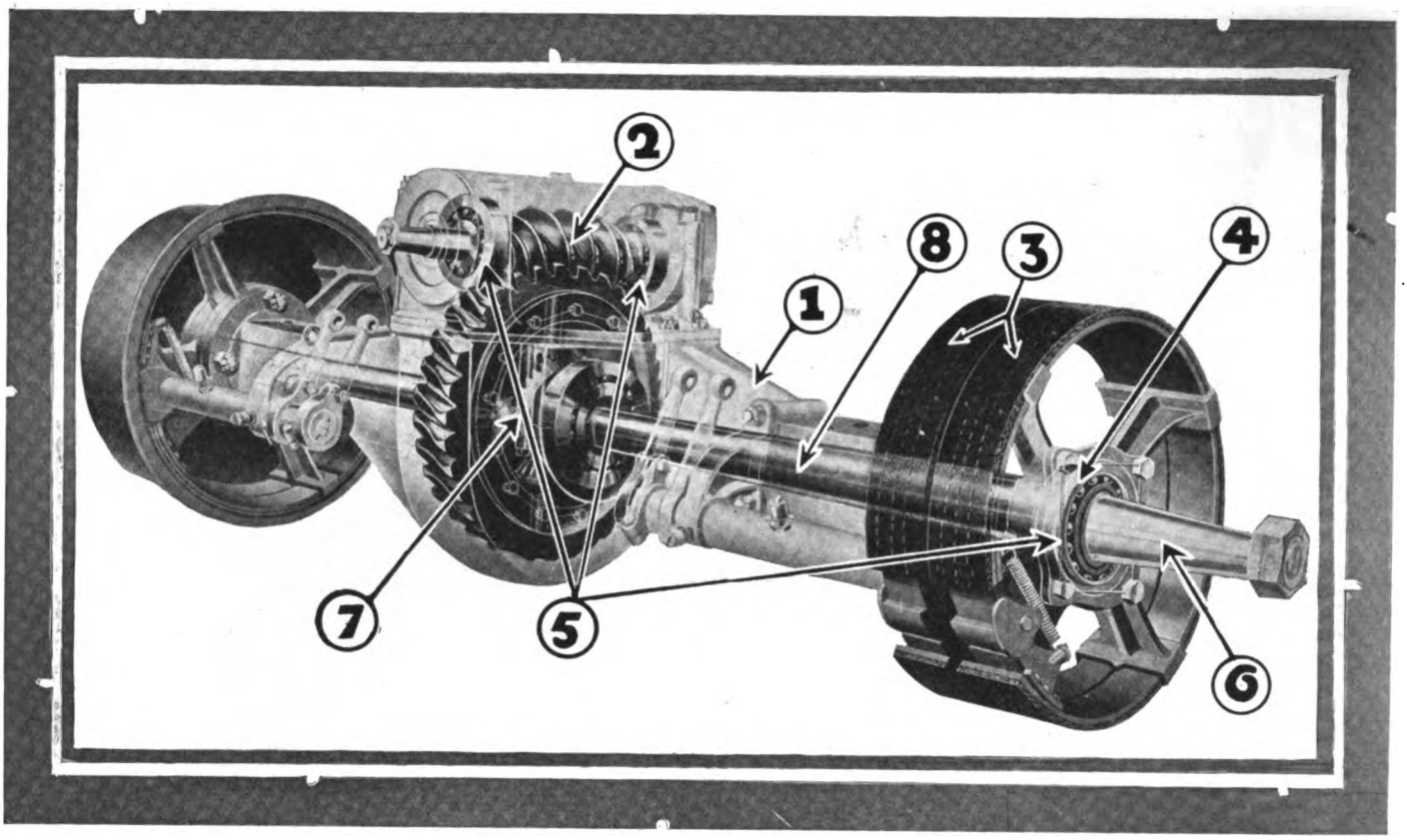
No matter the amount of work, the length of hauls, the difficulty under which your trucks are loaded or the condition of the roads, the ***stamina and wear*** that have always characterized KisselKar Trucks will enable your haulage department to be "always on the job."

Let us send you information and data on how KisselKar Trucks are ***making good*** with owners in ***your line of business.***

Dealers—A KisselKar Truck Agency in unoccupied territory is an investment—a dividend producer of the first magnitude. Investigate.

KISSEL MOTOR CAR CO., Hartford, Wis., U. S. A.

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Why SHELDON Worm Gear Rear Axles are Better Axles

1. One piece cast steel housing—built like a bridge and just as strong—lightest and strongest type of construction known.

2. Straight or David Brown type worm—highest efficiency—longest life—guaranteed for one year—mileage of 100,000 miles and upwards frequently reported.

3. Double internal brakes—powerful, quick-acting, unfailingly sure. All working parts enclosed and protected from foreign substances—unequalled for economy of upkeep.

4. Semi-floating wheel bearing construction—fewer parts—lighter weight—greater strength—economy of manufacture and operation.

5. Ball-bearing mounting thruout—high efficiency—bearing adjustments eliminated.

6. Tapered hub mounting—permits of demountable wheel—makes tire changes quick, easy and economical.

7. Oversize differential—never wears out—built to outlast the truck.

8. Big husky drive shaft—3 1-2 per cent nickel steel forging—correctly heat treated—tapered from differential to wheel bearing—gives strength where needed for every character of stress imposed upon it.

THE SHELDON AXLE & SPRING CO.

Makers of Springs and Axles for Heavy Duty Service for over 50 years

Wilkes-Barre - - - - - - - - Penna.

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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The Home of the HALL

The HALL TRUCK is noted

1 **For its Strength,** that is its ability to save the day in a crisis, to stand up under heavy overloads without the slightest straining or deterioration of speed and balance.

2 **For its Speed,** that is real speed, the ability to get the work done quickly without hurrying. The ability to get there, unload, and get back without loss of time.

3 **For its Economy of Upkeep,** that is freedom from repair needs, light weight, preventing wasted power, full results from gasoline used, durability under hard, continuous work.

THE PICTURE SHOWS THE FACTORY WHERE these attributes are built into the Hall. Here are forged and machined the sturdy chassis frames, which are linked with the supremacy of the Continental Motor, Timken Axles and Bearings, and other standard units.

IRON WORKERS OF LONG EXPERIENCE, men who know just what it means to make weight-carrying, strain-resisting, non-vibrating frames of the finest metal, are at work here making the chassis members.

THE SPEEDIEST AND MOST EFFICIENT DUMPING DEVICE (Wood Hydraulic Hoist) known to truckdom is fitted on every Hall Truck, helping to give it the time-saving qualities for which it is famous.

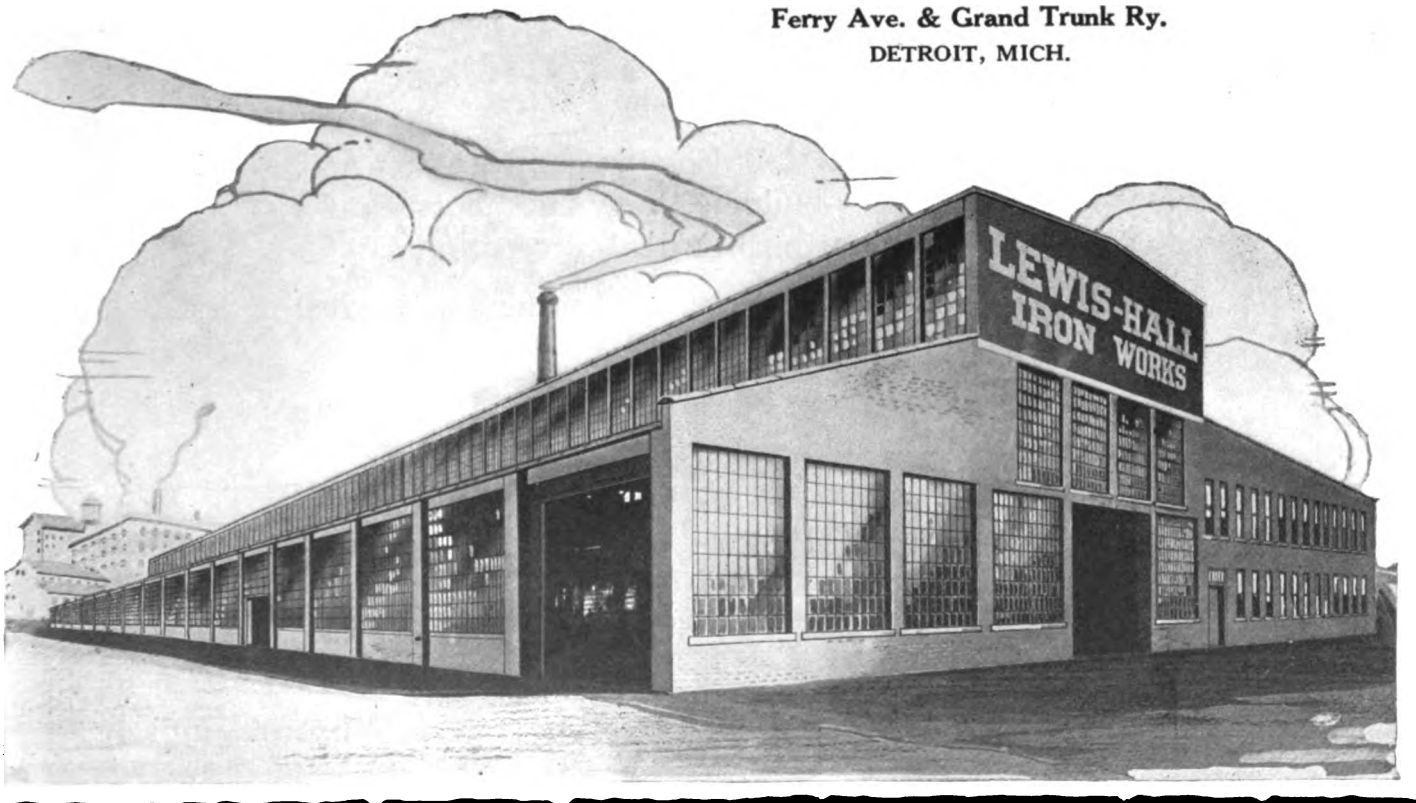
DEALERS who handle the Hall not only receive every other sort of sales help, quick deliveries and generous terms, but we assist them in financing partial payment sales. Write for complete Dealers' Proposition.

Five Models: 2-ton, chain, $2,000; 3½-ton, chain or worm, $2,800; 5-ton, chain or worm, $3,600.

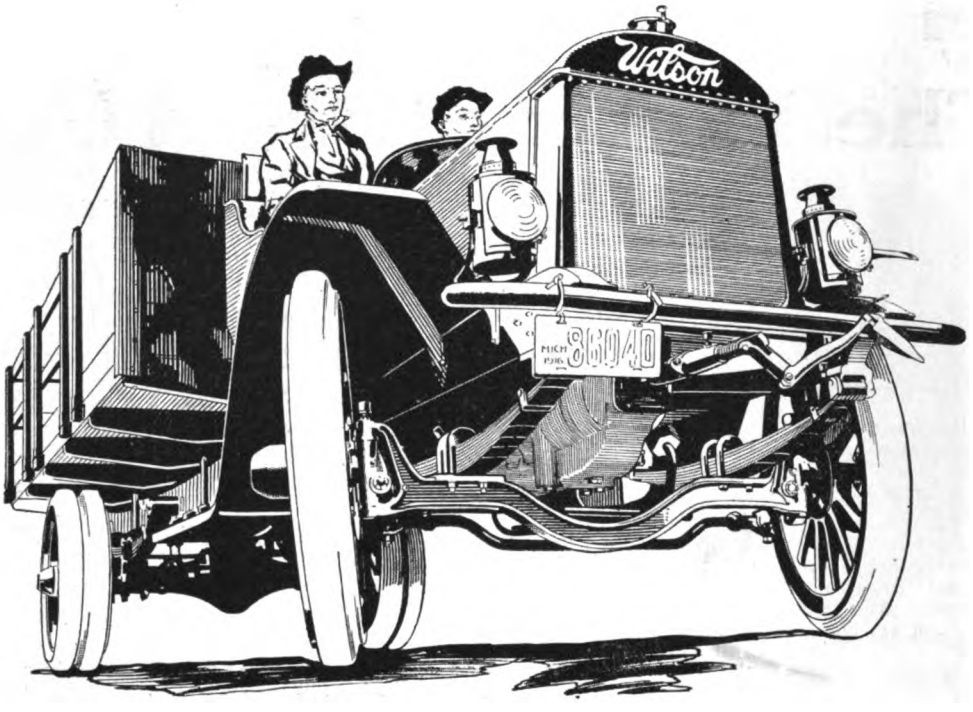
The Lewis-Hall Iron Works

Manufacturers of the Hall Truck
(Established 1873)

Ferry Ave. & Grand Trunk Ry.
DETROIT, MICH.



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We Give You a Quarter of a Century's Experience in This Truck

Before we built the first Wilson Truck, five years ago, we spent 25 years building heavy-duty, horse-drawn wagons—some of them to haul 8 to 10 tons.

This *means* something to you. It means *value*—real dollars and cents—

For it will strike you at once that this long experience enables us to build you a *better* motor truck; and it has proven a wonderful selling argument for Wilson dealers throughout the world.

1-ton, 2-ton and 3½ ton. Scientifically developed semi-trailers. Write for booklet "A"—and agency terms.

J. C. Wilson Company
486 Warren Ave. Detroit, Mich.
(2

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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FOUR WHEEL POWER
Means *Earning* Power

In the many industries in which F-W-D Trucks are giving daily service, they are performing well-nigh miraculous feats in bringing home a generous return on the investment.

For example, one F-W-D Truck owned by a large contractor, was called into service in an emergency by another contractor operating 7-ton trucks on road work.

The 3-ton F-W-D, by its certain traction, constant power and higher efficiency, *hauled more tonnage per day than the 7-ton trucks.*

Performance like this is not unusual in the F-W-D. Things that seem unbelievable in other trucks, it accomplishes with ease in its regular, average, daily service.

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Here is the F-W-D in action on the Mexican border. The stuff that makes it the great performer in *industry*, also makes it the *great four-legged war-horse.*

The hardships of war, the rotten going, rock roads, broken stone, quicksand and mud—all are pie for the F-W-D.

Thirteen war-ridden nations acknowledge it by putting the F-W-D into active service, in tremendous fleets, in their various armies.

When the U.S. Government equipped the first motor-truck regiment for service in Honolulu,

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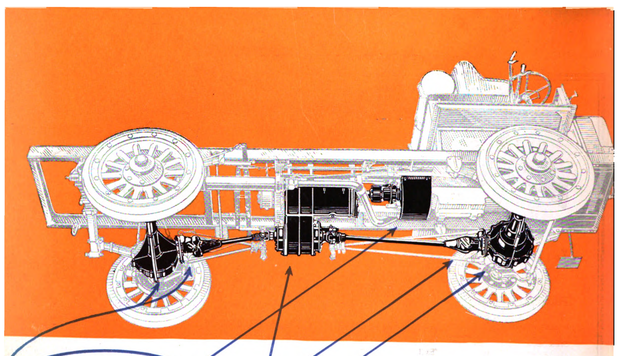
it had the record of every front-rank American truck for ready reference, from the recent work on the Mexican border. There was no guesswork about it—the purchase was based on definite data, on performance, stability, dependability, efficiency, economy and freedom from need of repairs.

The result was that Uncle Sam purchased 51 F-W-D Trucks—the entire equipment for this Honolulu regiment.

A product with a service record like this, a truck that in active comparative test, in actual service, has out-demonstrated every other high-grade American truck, is a remarkable selling proposition for live dealers everywhere throughout the World.

Write for the details of our dealer's contract.

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Multiple Disc Clutch through which power is conveyed from the engine to the transmission.

Forward Differential and propeller shaft. Power is conveyed to the front live axle precisely in the same manner as to the rear axle.

Rear Differential and propeller shaft through which half the engine power is transmitted to the rear road wheels.

The exclusive F-W-D *Center Differential* through which the power is divided and sent to front and rear axles. Its equalizing action between the two axles is precisely the same as that of the front and rear differential between two wheels.

This picture shows the path of power in the F-W-D truck

—Shows how the engine power is *divided* at the Center Differential and sent to both *front and rear* driving axles.

The F-W-D is the only truck in which the Four-Wheel-Drive principle is correctly applied, through the exclusive center differential.

It is the correct application of this principle that permits equalized distribution of load, effects such remarkable tire economy and enables the F-W-D to accomplish things impossible to any other truck in the world.

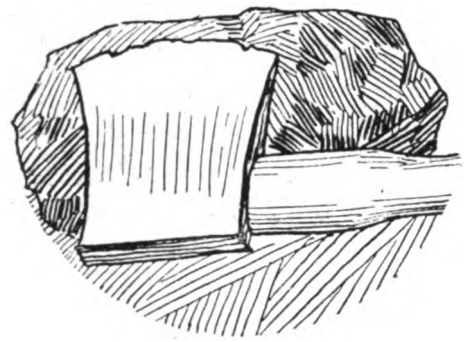
There is some attractive open territory at the present moment in which there is a remarkably profitable opportunity for dealers of sizable caliber.

Write us for the details

Four Wheel Drive Auto Co.
Clintonville, Wisconsin

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You can split a Piece of Wood **B U T** **You can't split a Piece of Stone**

Has No Grain

VEHISOTE

No Laminations

It differs from a grained or laminated material largely as steel differs from wood.

Steel is a fibrous material made by a fluxing and molding process. So is VEHISOTE.

Wood grows in rings or layers and is essentially a laminated material—a succession of separate fibres clinging to each other.

Wood, like any laminated or layer material, is susceptible to splitting and separation of its fibres.

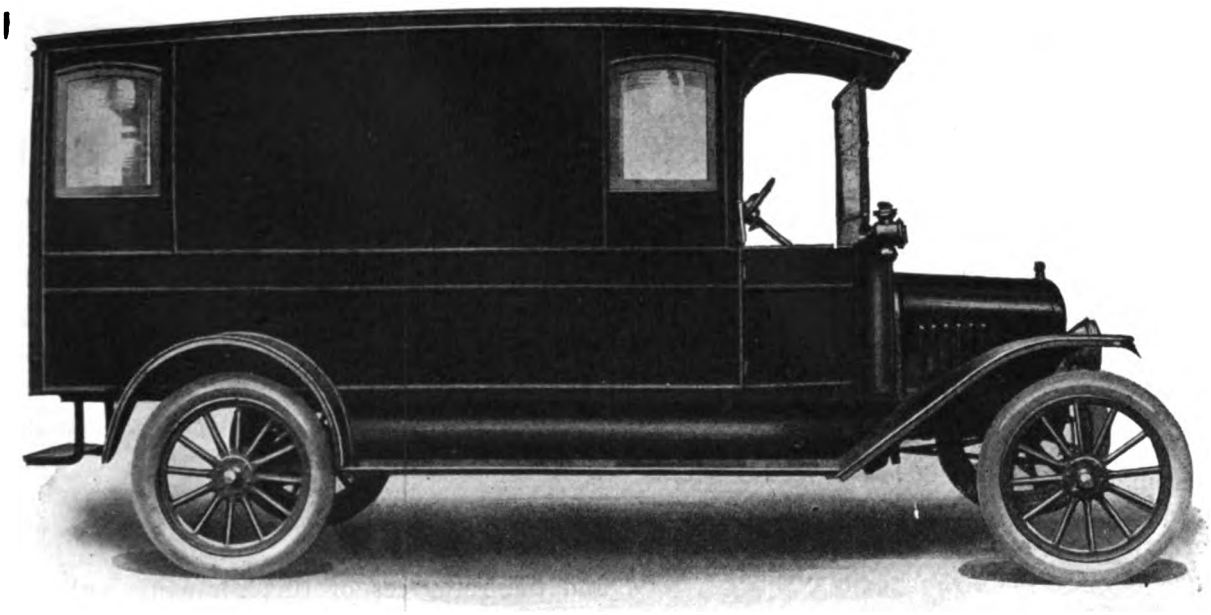
Homogeneous materials like VEHISOTE, in which the fibre is fluxed and run together, cannot split.

Steel is heavy. VEHISOTE is light.

Steel is expensive from an up-keep standpoint. VEHISOTE is economical.

From every standpoint VEHISOTE is an ideal material for vehicle body panels.

Try it.



Made by the H. H. Babcock Company, of Watertown, N. Y., who have built many hundreds of VEHISOTE panel bodies, that have been in continuous service for several years, all speaking a good word for Vehisote.

THE PANTASOTE COMPANY

11 Broadway, New York **People's Gas Building, Chicago**

Vehisote is carried in stock by

The Scovel Iron Store Company, San Francisco
The Sligo Iron Store Company, St. Louis
E. C. Kadow & Company, Chicago
Gerhab & Ludlam, Philadelphia
C. H. Tiebout & Sons, Brooklyn, N. Y.
Wm. E. Kleine & Co., New York City
H. Hett & Sons, New York City
H. D. Taylor & Company, Buffalo

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The Fulton 1½-Ton Motor Truck Has Established the Greatest Value in the Commercial Car Industry

Recognition of its startling worth has been attested by 200 dealers who now offer Fulton Trucks throughout the United States and Foreign Countries.

Engineers in every branch of the motor industry have placed the stamp of approval upon this chassis—responsible, wide-awake dealers have, and are continuing, to recognize its tremendous selling powers—users from the largest corporations to the single truck buyer have expressed their satisfaction with its performance—in a word, *Fulton Trucks have made good.*

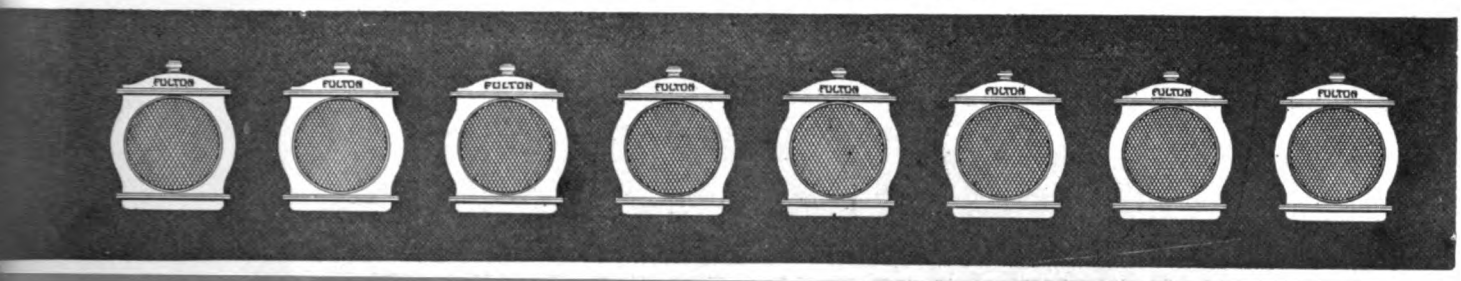
From the experimental chassis of last year, through the most severe and grueling tests of our engineering laboratory, and the service tests of users, right up to today, no flaws have been found and no changes have been made in construction.

These are facts—not theories. Production has been increased to 2500 for 1917, and all deliveries are going forward as per schedule.

We will live up to every contract we make, and stand behind every truck we produce. Our guarantees are backed by a manufacturing organization which is now recognized as the largest on Long Island, where the New York motor center is located, and the resources of this company which has an authorized capitalization of $7,500,000.

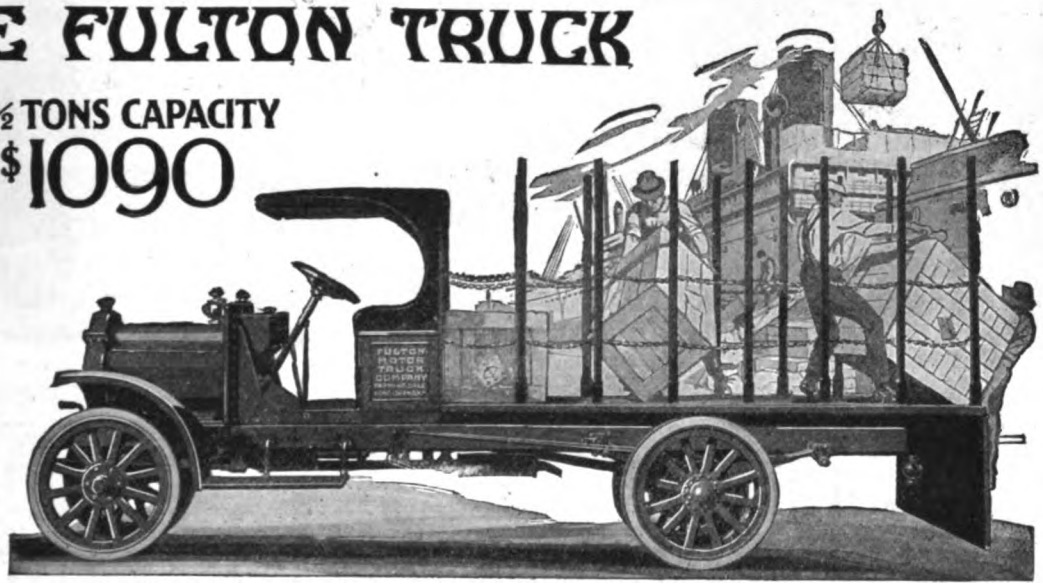
Some territory is still available for wide-awake dealers. Come to the factory if you can.

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THE FULTON TRUCK

1½ TONS CAPACITY
$1090



Fulton Truck Specifications

CAPACITY: 3,000 lbs.

MOTOR: Four cylinder, 3¾-inch bore, 4½-inch stroke, L head type cast en bloc, 22.5 H. P.—S. A. E. rating.

COOLING: Fulton exclusive design radiator, in front of hood, allowing use of 20-inch fan, giving positive cooling in any climate.

CARBURETOR: Automatic, float feed, hot air quick-starting device.

IGNITION: Splitdorf "Dixie" high tension magneto with set spark.

LUBRICATION: Combination pump and splash system. Designed especially for heavy-duty motors.

CLUTCH: Multiple disc running in oil. A unit with motor and transmission but very accessible.

SPRINGS: Special Fulton design. Front springs, semi-elliptic, 42 inches long, 2¼ inches wide. Rear springs, semi-elliptic, three-point shackle suspension, 50 inches long, 2¼ inches wide. All springs are heavily bushed.

BRAKES: Emergency brakes, 13½ inches in diameter, 2 inches wide, operated by hand lever. Service brakes, 14 inches diameter, 2½ inches wide, operated by foot pedal. All brakes applied direct to rear wheels.

FRAME: Fulton special design, heat treated steel channel section 5 1-16 inches by 2½ inches by 3-16 inches. Extra heavy, designed to carry 50% overload.

AXLES: Front Axle drop forged I-beam section, heat-treated steel, heavy steering knuckle spindle, with tie rod mounted aft and 10-inch road clearance. Rear axle, Daimler internal-gear design, with heavy dead axle carrying the load. All power is transmitted directly to the driving axle with minimum loss.

WHEELS: Front, 34 x 3½ inches, having twelve extra heavy spokes and mounted on roller bearings. Rear, dual 34 x 2½ inches, having twelve extra heavy spokes and mounted on heavy-duty roller bearings.

WHEEL-BASE: 136 inches, standard tread, and allowing short turning radius.

STEERING-GEAR: Screw and nut irreversible with 18-inch wheel. Left side drive for American; right side for export.

GASOLINE TANK: 14-gallon capacity.

TIRES: 34 x 3½-inch front, 34 x 2½ dual, rear, solid rubber.

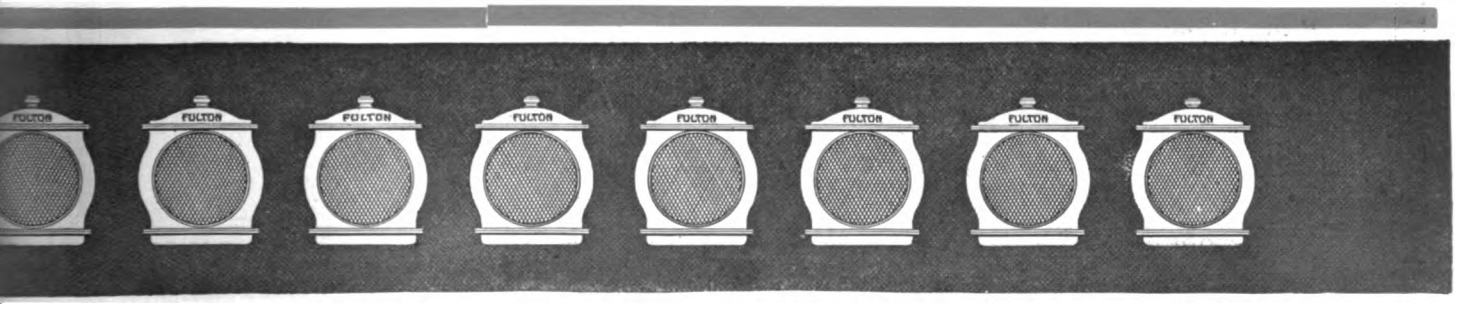
DIMENSIONS: Standard chassis over all 200 inches. Distance from back of seat to end of frame, 9 feet.

EQUIPMENT: Horn, 2 side lamps and rear tail lamp, tool kit.

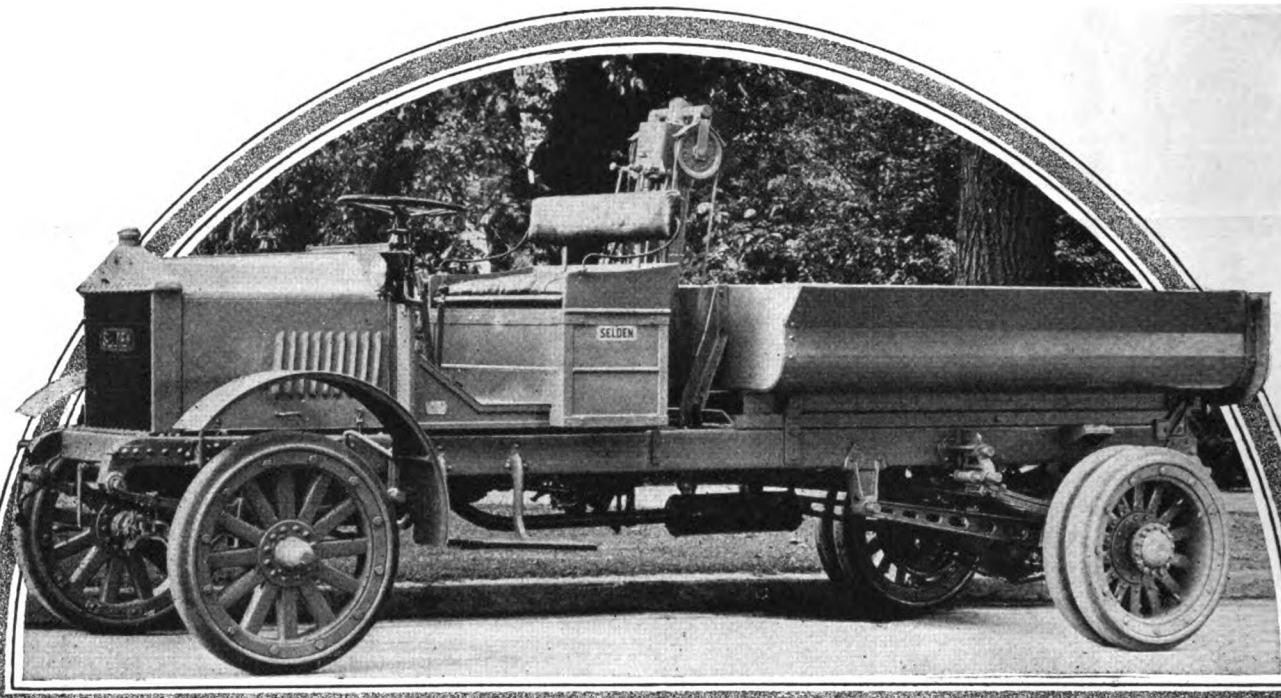
Blue print of chassis furnished to all body builders.

Price, Chassis $1,090 F. O. B. Factory.

Fulton Motor Truck Company
Farmingdale-Long Island-New York



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Selden Trucks

SELDEN TRUCKS · SELDEN · IN-BUILT QUALITY

In every commercial activity Selden Trucks are rendering maximum service at minimum cost.

Their massive construction—great strength—surplus energy—give them power to endure for a long time the most severe test to which a motor truck can be put.

Consider the experience with Selden Trucks of a Schenectady trucking concern, who wrote us as follows: *"We have used a Selden Truck in our trucking and moving business for three years. During that time it has run over 50,000 miles and we haven't spent $50 for repairs, except tires, and she is still running. That's why we purchased another Selden."*

Dealers: Consider the unlimited possibilities the Selden Line of ¾, 1, 2, 3½ and 5 Ton "IN-BUILT QUALITY" Trucks offers you to build a permanent, profitable truck business in your community.

Write for our Dealer Plan.

Selden Truck Sales Company

Rochester, N. Y., U. S. A.

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Scientific Instruments Prove S-V Superiority

Truck owners buy Goodyear S-V Truck Tires to reduce truck tire costs—because they *believe* these tires deliver longer mileage, and they *cushion* trucks and loads more effectively.

The soundness of this belief is proved by the accurate records of two scientific instruments which, together, tell all there is to be told about the relative excellence of truck tires.

The odometer measures mileage.

Odometer records gathered in all parts of the country and in all sorts of trucking service, tell an amazing story of S-V durability and longevity — mileages up to and exceeding 40,000 and an average of over 13,000 miles for 700 tires used in 60 cities.

The durometer measures hardness.

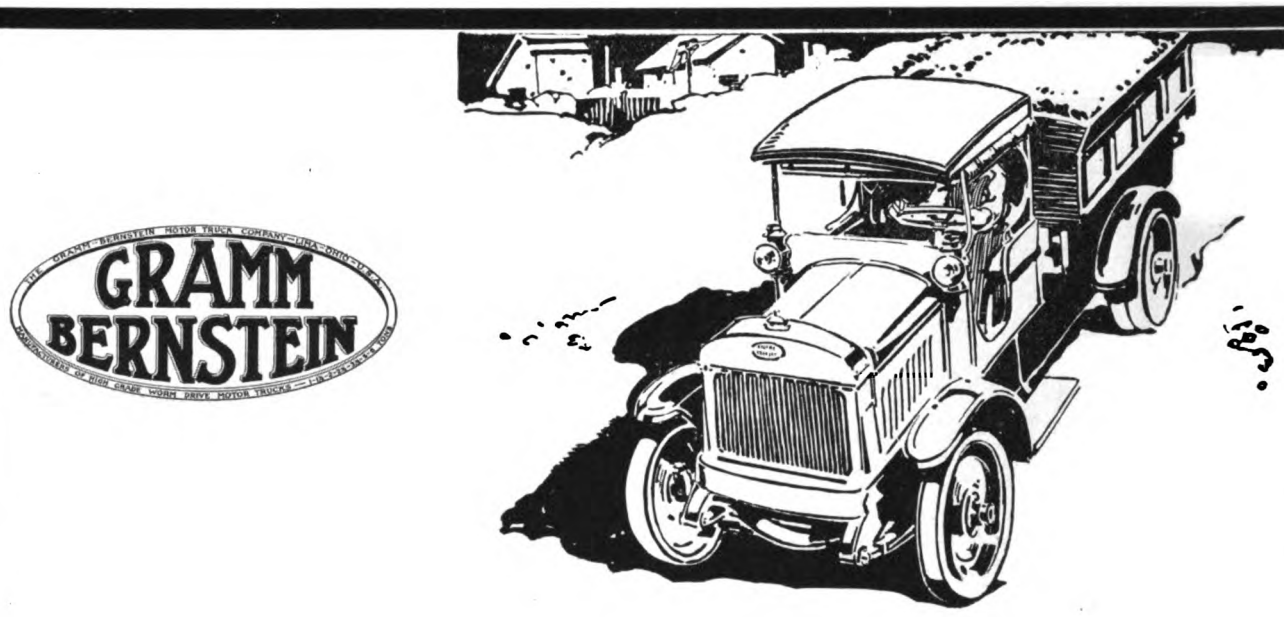
Durometer records secured by the Goodyear experimental department show that the S-V Tire, in spite of its wonderful toughness, is softer than other solid tires, therefore more resilient—better able to *cushion* a truck throughout its many thousand miles of service.

We should be very glad to see every truck owner in America buy all tires solely on the strength of scientific odometer and durometer records — because we know, exactly, what these truth-telling instruments have to say about Goodyear S-V's.

The Goodyear Tire & Rubber Co.
Akron, Ohio

GOODYEAR
AKRON

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GRAMM BERNSTEIN

Extra Powerful Brakes

THE GRAMM-BERNSTEIN clutch, transmission, brakes, springs—the entire driving mechanism is completely developed. For service-on-the-road depends not on one function but on all.

Not one detail, however insignificant it might ordinarily seem, is overlooked in G-B design to make the finished truck a complete success—for both user and dealer.

Motor truck dealers throughout the country think well of Gramm-Bernstein trucks. For 16 years they've followed G-B success—they've formed a deep respect for it.

And the G-B sales plan is equally well thought of. It's practical, liberal, wide in its scope and makes possible a profitable return. We want to explain the details of it to you. We want you to look into the G-B truck and see what a substantial masterpiece it is. Write or wire today for particulars.

The Gramm-Bernstein Motor Truck Co.

13 Gramm Blvd., Lima, Ohio



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WINTHER
MOTOR TRUCKS
KENOSHA WIS.

Out of the Melting Pot Came WINTHER Motor Trucks

Into the service of Uncle Sam in Mexico went America's best motor trucks—47 trains of 27 to 33 trucks each—produced by a score of the foremost builders.

Out of the ruins of those trucks came the internal gear drive, locking differentials, drop forged axles, cast steel wheels, Timken bearings, four-bearing crank shafts, force-feed oiling systems, 3½% nickel gears, constant-mesh transmissions and vanadium steel springs—triumphant.

These successful parts, from the great melting pot of trucks, are built into Winther—the first complete line of internal-gear driven heavy-duty American-made trucks. Parts that made good in Mexico make Winther Trucks make good in commercial service.

Produced in the following capacities, they blanket the field:

Model 47, Maximum 4,000 Pounds
Model 67, Maximum 6,000 Pounds
Model 87, Maximum 8,000 Pounds
Model 127, Maximum 12,000 Pounds

Applications from reputable dealers solicited.

Winther Motor Truck Company
Kenosha Wisconsin

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Travelling More Than 9000 Miles GMC Truck Makes Remarkable Trip from Seattle to New York and Return

ALL of us in the GMC family have always been mighty proud of the performance of GMC Trucks.

And there has been a lot of solid satisfaction in selling and building them. We all know that in service they live up to our claims and in most cases exceed the fondest expectations of the owners.

For you, in selling GMC Trucks, and we, in advertising them, have always tried to be conservative—preferring to allow the trucks to speak for themselves by their performance.

While you all were busy caring for the sales in your territories, and we at the factory were busy building trucks to meet the increasing demand, there was a GMC Truck forging its way across the continent, over the Northern route from Seattle to New York.

The Chamber of Commerce at Seattle — the boosters club of that wonder city—turned a 1½ ton GMC Truck toward New York Harbor.

The pilot, William Warwick, was instructed to take the truck thru to New York—"*Travel the National Parks Highway,*" they said. "*Travel every foot of the way on the truck's own power—prove to the world that the National Parks Highway, altho not completed, is nearer an actuality than a dream.*"

They reasoned if a ten-and-a-half solid tired motor truck, loaded to the roof, can make the trip at this time of year, surely all questions regarding the practicability of the highway are settled.

That these men selected a GMC Truck for this gruelling, history-making trip is a high compliment to the GMC Truck and to our organization, and likewise it is evidence of their own good judgment, for, as they said, they wanted *a truck that they could depend upon to make the trip.*

From the day the truck left Seattle until the afternoon it pulled up Broadway, 31 days actual running time, we have the say-so of Warwick that the trip was anything but uneventful.

There were mountain roads that were little more than pack trails—grades up to 25%, and plenty of them—hairpin turns and steep declines that put the brakes and entire truck construction thru the third degree.



"For some reason or other at this particular point there are no signs to warn the motorist against violation of the speed laws"—says Wm. Warwick, pilot of the transcontinental GMC.

On scores of occasions the truck was buried axle deep in mud and gumbo. Dozens of times bridges gave way under the weight, and on more than one occasion on the trail and in the flood country town folks placed odds of 10 to 1 that it could not go thru.

And, in each case the GMC "brought home the bacon" and demonstrated its power and endurance in a fashion that caused men to marvel.

"*If ever a truck was called upon to demonstrate its right to live, this GMC was the truck*" says Warwick. "*If ever a truck proved its construction was right, it was this GMC.*" With the exception of changing a spark plug, not an adjustment was necessary, not a repair of any sort made.

The truck reached its destination in fine shape, and, after a careful inspection was pronounced to be in perfect mechanical condition.

Conclusive proof of the super-endurance of GMC Trucks.

Remarkable — you say — but wait, Manager Warren at the New York branch said, "*Let's show the folks at Seattle and business men throughout the country, what a GMC can really do when it starts out.*" Said he, "*Let's send the truck back to Seattle on her own power*"—and we did.

The same truck driven by the same driver again crossed the continent—this time over a Southern course to Los Angeles and thence to Seattle,—travelling in all more than 9000 miles, mastering every conceivable obstacle—every foot of the way on its own power—unassisted by any motor, team or man except the driver, William Warwick.

The record of this remarkable trip means much to prospective truck owners, for it is a more severe test than trucks will get in ordinary day in and day out work.

Read the gripping story in our new illustrated booklet just issued. Pass copies out to business men in your locality.

Write TRUCK HEADQUARTERS today for a supply of the booklets and photographs taken enroute by Mr. Warwick. (188)

GENERAL MOTORS TRUCK COMPANY
PONTIAC, MICH.

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GOODRICH

TRUCK TIRES

Stand Up Under Fire



This photograph shows a fleet of White trucks equipped with Goodrich Truck Tires on their way from Verdun to the Somme front

JUST as Verdun was saved by the timely use of motor trucks so is the Somme front being held with the aid of great fleets of motor transports carrying rations and ammunition over highways torn by shell fire where railroads have been put out of commission by German guns.

American-made truck tires were conceded superior to the European type by British and French motor transport experts after careful observation of all tires in actual service.

Of all the American makes GOODRICH Truck Tires were pronounced by officials most satisfactory. They are giving the same satisfactory service in commercial work everywhere. They stand up under heavy loads on all kinds of roads just as they stand up under fire in Europe.

Specify GOODRICH in peace or war. They're Best in the Long Haul

The B. F. Goodrich Rubber Company
Akron, Ohio

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A "Traile

Profits in generous measure will be

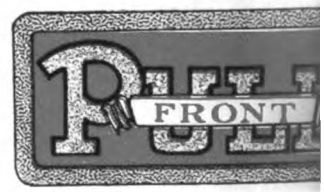
Every Working Part in Pull-More Power Plant

LESS THAN THIRTY SECONDS is all the time required to gain access—COMPLETE, VISIBLE, WORKABLE ACCESS—to every part of the Pull-More power plant.

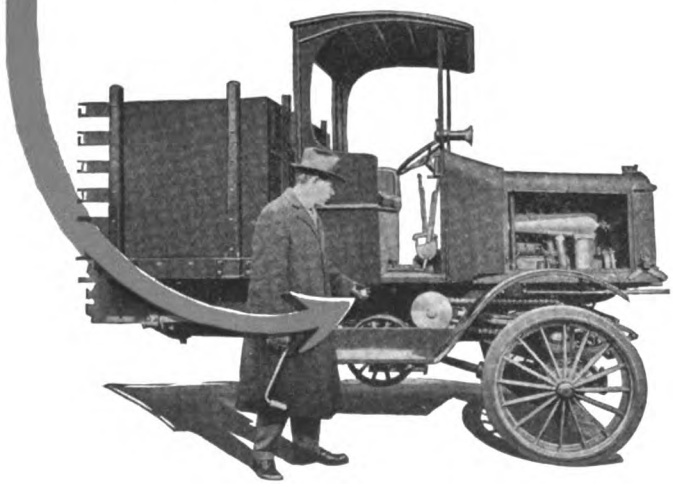
This wonderful accessibility is secured by extending the crank case to include the clutch, gear set, differential—all the operative mechanism between the fan and the jack shaft. The Pull-More crank case is in two parts, upper and lower, hinged together at one side, and when opened up, all the working parts of the lower plant are completely exposed and can be inspected, adjusted or replaced.

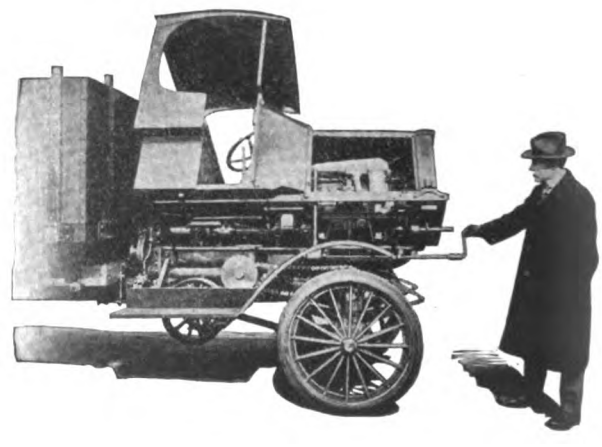
Without touching a bolt or nut or wrench, IN LESS THAN THIRTY SECONDS, the entire upper portion of the front unit, including the cab and engine, can be tilted over as shown in the photograph below, to give COMPLETE, VISIBLE, WORKABLE ACCESS to the engine, clutch, differential, and gear set. All this can be done without stopping the engine, which is a great additional advantage, as the parts are shown in operation. A child could operate the mechanism which exposes the working parts for inspection, and without soiling the hands or clothes.

Truck efficiency and economy of upkeep demand co plete, quick and convenient accessibility to all worki parts. The ability to make, right on the road, a repla ment, repair or adjustment in a few minutes, and dri on—compare this with taking the truck to a rep shop (perhaps towing it in and removing the load) have the work done by an expert with special app ances, with the attendant delay and expense, and t cost of the repair itself multiplied several times by t difficulty and time required to get at it.



With the wonderful Pull-More accessibility, it is no longer necessary to crawl underneath a truck and labor for hours, to adjust a crank shaft or connecting rod bearing, or make any kind of a repa or replacement, or to see what is neccessary to b done. Pull-More accessibility will reduce repair bil from DOLLARS TO CENTS and save time an service lost when trucks are out of commission fo repairs.





Pull-More Motor Tru

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r"of Opportunity

ure reward for every Pull-More Dealer



Accessible in Less Than Thirty Seconds of Time

Assembled compactly with the wonderful, accessible Pull-More power plant are the vital parts, that can always be working efficiently, because they can be inspected daily or at any time when there is the slightest indication of need. With all other type of motor trucks, these parts are practically inaccessible from being mounted in seperate housings and buried underneath the truck, where it is impossible for the operator to inspect the parts, and often any irregularity in the action of the mechanism is not noticed until serious trouble has resulted—a natural consequence, "REPAIR BILLS and TRUCK IDLENESS."

MORE DRIVE

Pull-More wonderful accessibility is a positive assurance of the lowest upkeep cost of any commercial vehicle. Where HOURS are consumed making repairs on any other type of truck, MINUTES only will be required with a Pull-More installation.

DEALER'S OPPORTUNITY

Demand for motor trucks is increasing with leaps and bounds. Associated with this demand for quantity is a demand for quality—a truck that will withstand the grueling service of modern transportation—one that will economize time and return a profit.

Quality is paramount in the manufacture of the Pull-More. Incorporated in this quality truck are features of design and construction which will inevitably appeal to truck buyers.

Seldom, if ever, will a single demonstration of the Pull-More fail to convince a truck buyer and prove the superiority of its novel design and construction.

A demonstration of the front drive will prove that the power is more effective, the fuel consumption less, the tire mileage increased, and the traction bettered.

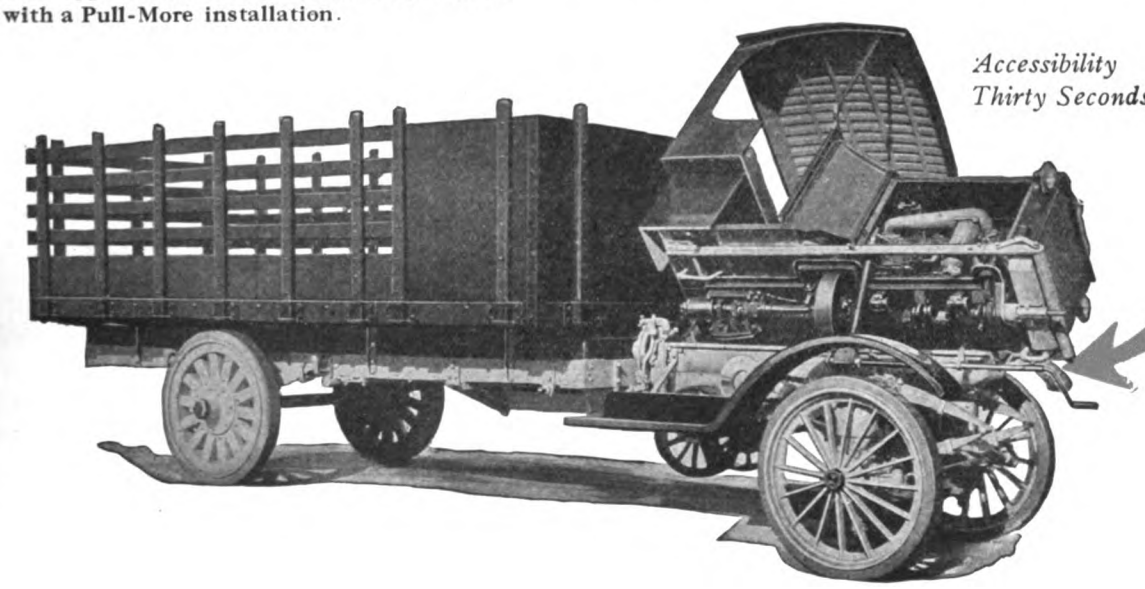
Note the wonderful Pull-More accessibility—COMPLETE, VISIBLE, WORKABLE ACCESS to every part of the Pull-More power plant in LESS THAN THIRTY SECONDS—

The two-unit idea, combining in one vehicle the advantages of both tractor and truck: the front unit or power plant being separable from the rear or carrying unit, and absolutely free from load strains—

Pull-More three point suspension for both front and rear units strength and sturdiness coupled with perfect, ideal flexibility.

Mr. Dealer, Pull-More is the best truck proposition in the WORLD. If you will just take time to briefly analyzs this wonderful QUALITY truck, it is a safe assumption you will realize its superiority over any other motor truck made.

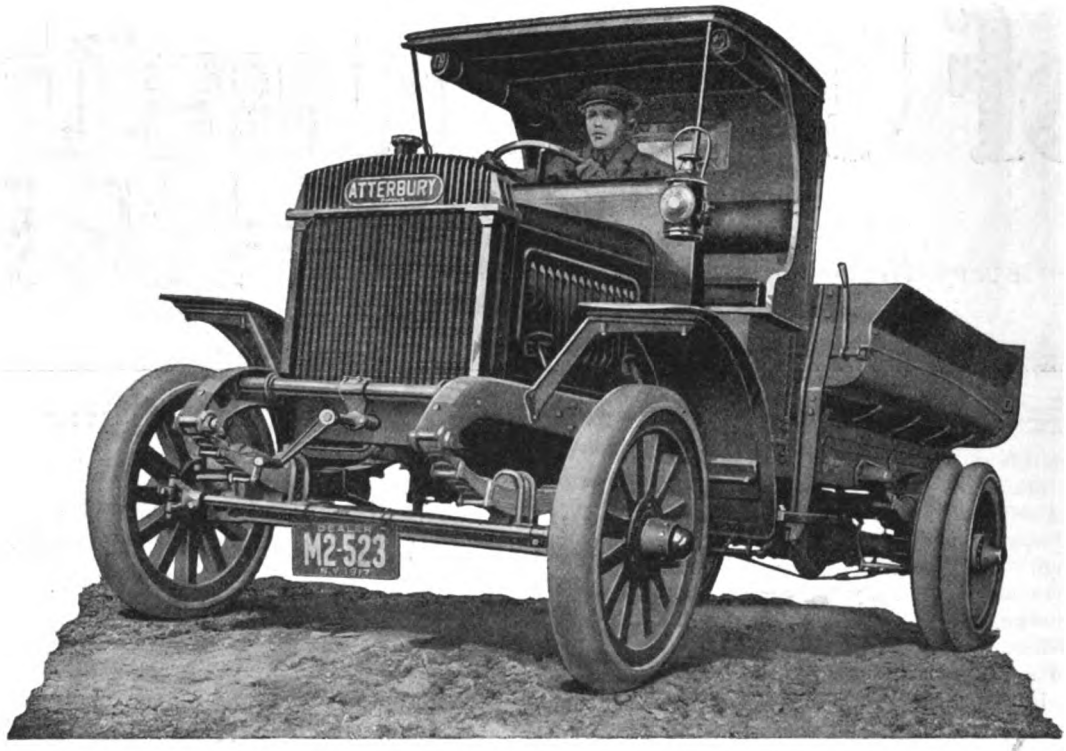
Write or wire today—perhaps your territory has not been alloted.



Accessibility Thirty Seconds

k Co. The Union Arcade. Pittsburgh, Pa.

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TOOK 12 YEARS TO PERFECT THIS TRUCK

The fact that the Atterbury 1 Ton, 1½ Ton, 2 Ton and 3½ Ton Trucks are being bought in increased and repeated numbers by the country's greatest firms, is the natural result of the Atterbury's quality, due to over 12 years of progressive evolution.

MOTOR TRUCKS OF
ATTERBURY
MAXIMUM SERVICE

BUFFALO NEW YORK

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REPUBLIC TRUCK TIRES

Test This Tire Beside Any Other

REPUBLIC TRUCK TIRES are made of Prōdium Process Rubber.

We know that this process prolongs the life of the tire.

We know they wear down evenly and smoothly.

We know they are springy and responsive.

We know they are practically immune to cutting and chipping.

We believe they are the best truck tires made.

We would like to have you prove this for yourself by testing one alongside of any other made of like size.

Republic Truck Tires are laminated. They are built up ply on ply on a steel channel base and vulcanized into a solid mass. There is no single splice to give out under road pounding as is sometimes the case with tube-made solid tires.

The Republic Rubber Company
Youngstown, Ohio

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HESS-BRIGHT'S CONRAD PATENTS ARE THOROUGHLY ADJUDICATED



HESS-BRIGHT BALL BEARINGS

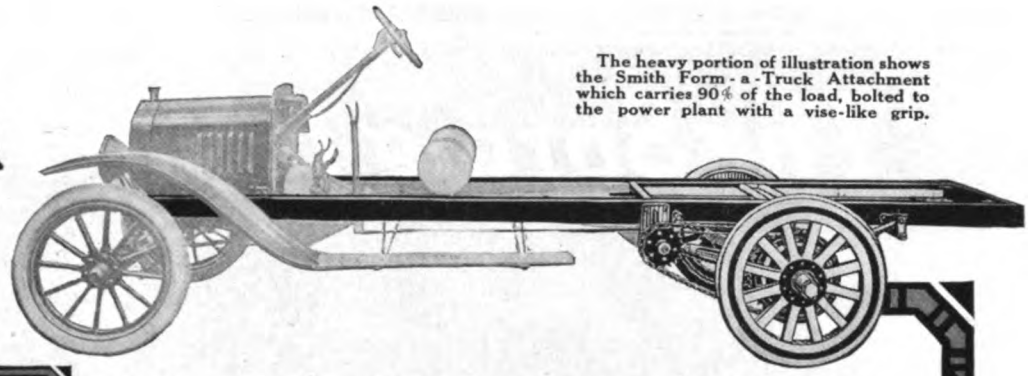
Inspire confidence wherever known. *They bear the load efficiently.* The quality of HESS-BRIGHT BALL BEARINGS represents the built-in-intention of the world's best bearing makers.

THE HESS-BRIGHT MANUFACTURING COMPANY
PHILADELPHIA, PA.

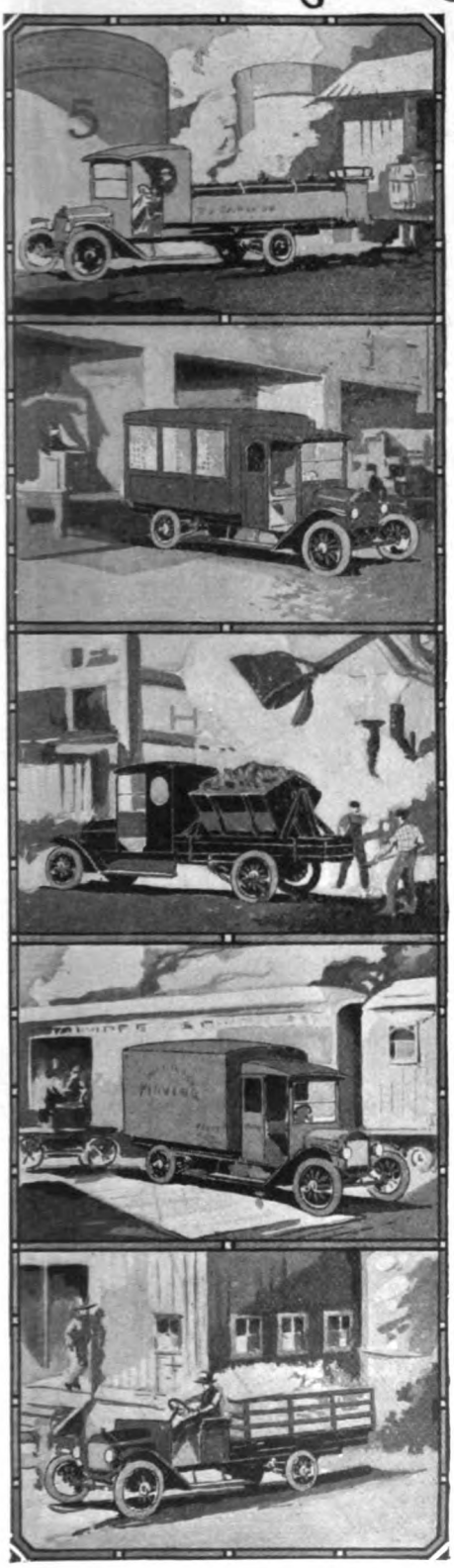
Hess-Bright Distributors for Retail Trade in Every City of Importance

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Smith Form-a-Truck $350 f.o.b. Chicago



The heavy portion of illustration shows the Smith Form-a-Truck Attachment which carries 90% of the load, bolted to the power plant with a vise-like grip.



There is a Big Premium on Smith Form-a-Truck Dealerships this Year

IF you can qualify as a Smith Form-a-Truck dealer—if your territory is still open, now is the time to act. Only the livest, dealers are being considered.

Many of the real business getters—men with the reputations for making big profits—who have built up enormous business—have moved to entirely new sections of the country where there were Smith Form-a-Truck dealerships available—

They know the money that is to be made.

And every established Smith Form-a-Truck dealer now can place a high cash value on his dealership.

Smith Form-a-Truck has exceeded every other achievement in the motor truck industry by a tremendous percentage—built up an industry of its own in less time than many manufacturers take to start their preliminary work.

Smith Form-a-Truck is the answer to the delivery and hauling question for every user of motor drawn or horse drawn transportation in the country.

Fleet orders from the big national buyers run up into several hundreds at a time.

Individual buyers total high into the thousands.

Production has already reached the amazing total of 350 a day to keep pace with orders for immediate shipment.

More Smith Form-a-Trucks are being built each month than all other makes of attachments combined, built for a year.

More in a month than any other manufacturer of motor trucks builds in a year.

Measured by any standard of earnings, dealer profits in Smith Form-a-Trucks are from 500% to 700% greater over a given time than any other make of motor truck.

Sales are faster—investment is less—and your money is turned with amazing rapidity. With the heavy premium already set on established Smith Form-a-Truck dealerships. There is always room for the right man—somewhere.

If you are a dealer who can qualify — who can maintain the high business standard maintained by the entire Smith Form-a-Truck dealer organization — there is a chance for you somewhere.

We are ready to receive your application — to show you just what we can do for you. But do not delay in getting it in. Wire today.

SMITH MOTOR TRUCK CORPORATION

Manufacturers of Smith Form-a-Truck

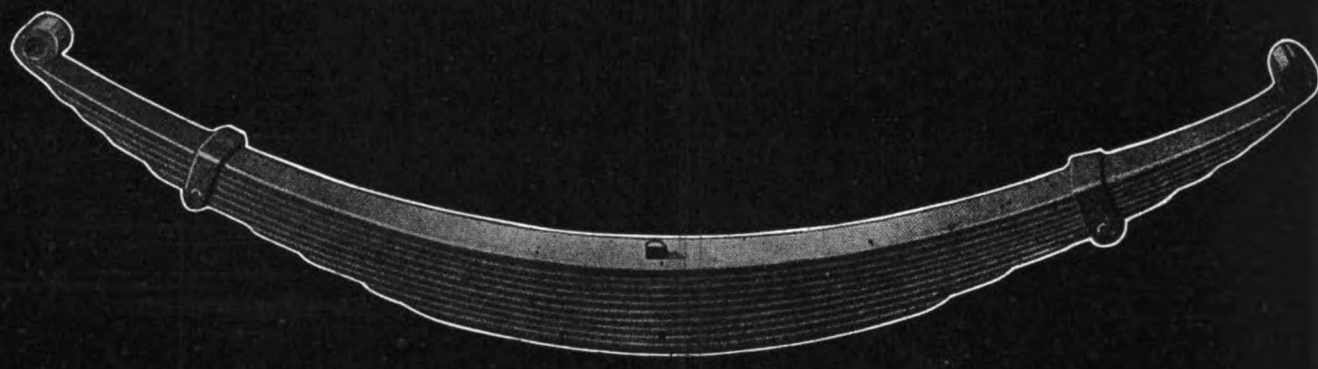
Executive Offices and Salesroom: Smith Form-a-Truck Building

Michigan Avenue and 16th St., Chicago

Eastern Branch, 1834 Broadway, New York
Southern Branch, 120 Mariette St., Atlanta
Kansas City Branch, 1808 Grand Avenue
Pacific Coast Branch, Pico and Hill Sts., Los Angeles
Omaha Branch, 2212 Harney St.

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"The Spring Is the Thing"



MATHER

Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

Minimum of Vibration

Genuine made only by

The Mather Spring Company

Toledo, Ohio

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Service

is the dominant factor in the sale of Motor Trucks

Every dealer instructs his salesmen on the wonderful service his particular truck will render.

How wonderfully well it will work in this or that business, regardless of conditions.

If the salesman is a forceful talker—if the truck has appearance and its manufacturer a passable reputation—a sale is usually made.

Then it is up to the truck to deliver the service—the kind that sold the truck.

The dealer, in every instance, is the first person to know if the truck is falling down.

He is the one who has to make this or that adjustment, who has to make this or that replacement.

And all regardless of whether it be the fault of the truck or the truck driver.

There is only one answer—represent the truck that will give the owner the most service with the least trouble.

Then you will cash in on your investment to the fullest extent.

You will not have to spend all your profits keeping the trucks in repair.

Your business will increase because you will have satisfied customers—the best salesmen you can possibly employ.

Many thousands of satisfied users are strong for the RUSSEL Internal Gear Drive Axle used on their trucks.

For that reason the dealer finds the RUSSEL driven truck easy to sell. There is nothing complicated about it. If any damage should happen to it, it can be repaired by any garage mechanic.

The RUSSEL Axle will drive a truck out of ruts, thru mud and deep snow, because it is efficient at all speeds.

It is not sensitive to lack of lubrication like other types of shaft drives for motor trucks.

It will not be harmed by the use of heavily laden trailers, which greatly tax the rear end of the hauling truck.

It affords greater ground clearance than other types, rendering it less liable to damage over unpaved streets or country roads.

The RUSSEL is the only shaft-driven motor truck axle that has a round bar load carrying axle. It is made of chrome nickel steel heat-treated.

The RUSSEL Drive is the only Internal Gear Drive Axle with spindles integral with the dead axle, and both axle and spindles are guaranteed for the life of the truck.

Dealers save money and time in handling trucks using the RUSSEL Drive.

They don't have to spend their profits in making replacements and repairs on drive axles.

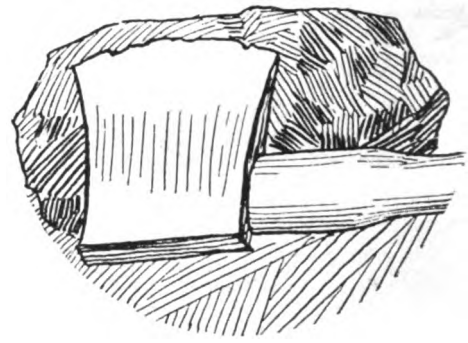
We will gladly assist any dealer who desires to secure territory rights for motor trucks equipped with the Russel Drive.

Russel

North Detroit

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You can split a Piece of Wood **B U T** **You can't split a Piece of Stone**

Has No Grain

VEHISOTE

No Laminations

It differs from a grained or laminated material largely as steel differs from wood.

Steel is a fibrous material made by a fluxing and molding process. So is VEHISOTE.

Wood grows in rings or layers and is essentially a laminated material—a succession of separate fibres clinging to each other.

Wood, like any laminated or layer material, is susceptible to splitting and separation of its fibres.

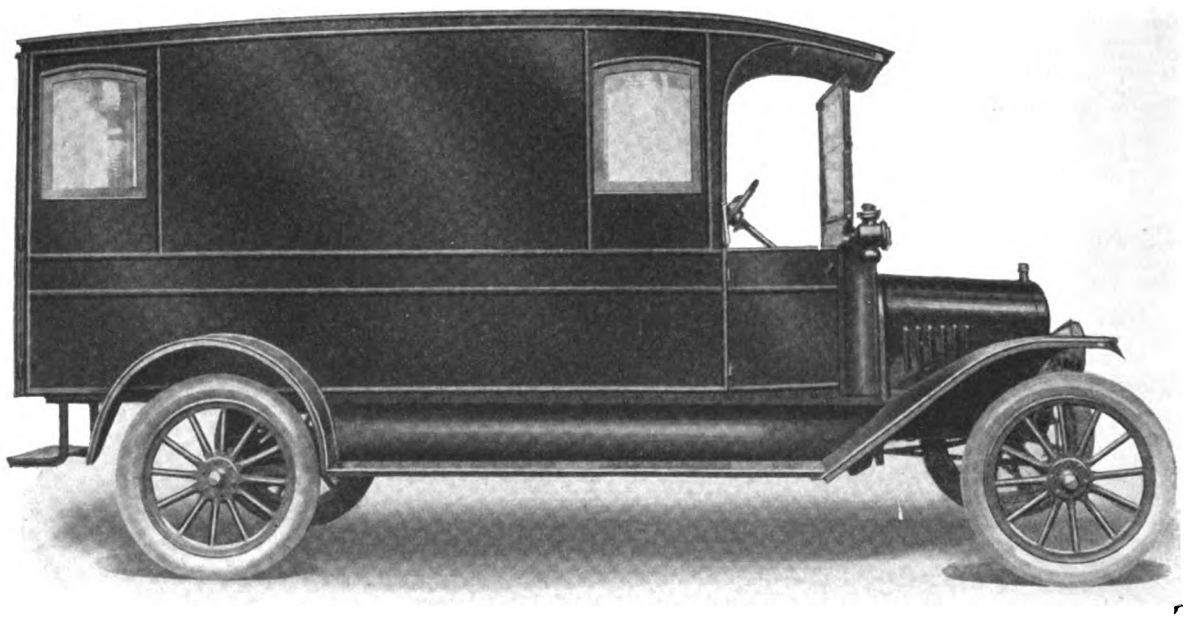
Homogeneous materials like VEHISOTE, in which the fibre is fluxed and run together, cannot split.

Steel is heavy. VEHISOTE is light.

Steel is expensive from an up-keep standpoint. VEHISOTE is economical.

From every standpoint VEHISOTE is an ideal material for vehicle body panels.

Try it.



Made by the H. H. Babcock Company, of Watertown, N. Y., who have built many hundreds of VEHISOTE panel bodies, that have been in continuous service for several years, all speaking a good word for Vehisote.

THE PANTASOTE COMPANY

11 Broadway, New York

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Vehisote is carried in stock by

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The COMMERCIAL VEHICLE
Read by Business Men

Published on the first and 15th of every month
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"NORMA"
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(PATENTED)

"A man is known by the company he keeps"—and a truck may be known by the character of its electrical accessories, provided the observer is wise in the distinguishing marks of quality. In the matter of magnetos and lighting generators, current practice has provided a means of identifying machines of maximum dependability—which in turn identify trucks of quality. That identifying detail is "NORMA" Bearings, adopted as the standard bearings in the high-grade magnetos and lighting generators used on cars and trucks of the better class.

Be Sure—See That Your Electrical Accessories are "NORMA" Equipped

Ball, Roller, Thrust and Combination Bearings

"NORMA"

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FROM

THE PRESIDENT'S PROCLAMATION

April 15, 1917

"TO THE men who run the railways of the country, whether they be managers or operative employees, let me say that the railways are the arteries of the nation's life, and that upon them rests the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind, no inefficiency or slackened power.

"To the merchant let me suggest the motto, 'Small profits and quick service'; and to the shipbuilder the thought that the life of the war depends upon him. The food and the war supplies must be carried across the seas no matter how many ships are sent to the bottom. The places of those that go down must be supplied and supplied at once.

"To the miner let me say that he stands where the farmer does. The work of the world waits on him. If he slackens or fails, armies and statesmen are helpless. He also is enlisted in the great service army.

"The manufacturer does not need to be told, I hope, that the nation looks to him to speed and perfect every process; and I want only to remind his employees that their service is absolutely indispensable and is counted on by every man who loves the country and its liberties.

"It is evident to every thinking man that our industry on the farms, in the shipyards, in the mines, in the factories, must be made more prolific and more efficient than ever, and that they must be more economically managed and better adapted to the particular requirements of our task than they have been; and what I want to say is that the men and the women who devote their thought and their energy to these things will be serving the country and conducting the fight for peace and freedom just as truly and just as effectively as the men on the battlefield or in the trenches.

"This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful, provident use and expenditures as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring."

In accordance with the suggestion of the President that his appeal receive widespread publicity, these extracts from his Proclamation occupy the advertising space scheduled for this month by The Autocar Company, of Ardmore, Pennsylvania.

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI May 15, 1917 No. 8

Dispatching System Keeps Trucks in Constant Operation

Coal and Building Supply Trade Insured Prompt Delivery Service From Each of Fifteen Yards—Uniform Trade Result of Combination

By Merrill C. Horine

IF one could plan an ideal motor truck installation, every truck in use would be kept in constant operation during the working day, and all of the hauling would be done with absolute reliability and regularity. There would always be a truck for the job and a job for the truck. This ideal is rarely approximated because of seasonable and other fluctuations in the volume of business. It is usually a feast or a famine. Both are wasteful and inefficient.

A truck clearing house has enabled the United Fuel & Supply Co. of Detroit, Mich., to maintain a fleet of forty-four trucks, so that the hauling of its coal and building materials is effected efficiently without any slackening of the working pace of the trucks and yet with little overtime work. The fact that the United Fuel & Supply Co. is an amalgamation of two other concerns, each of which formerly did an essentially seasonal business, has made this possible to a large measure, but the bulk of the credit must be given to the dispatching system.

Operates Fifteen Yards

The company operates fifteen yards scattered over the city of Detroit. The amount of hauling from these yards varies greatly from day to day, and the material handled is of such variety that several different kinds and capacities of trucks are required to handle it; yet the clearing house, by keeping track of the exact whereabouts of every truck at all times, can always assign a truck for every job and schedule these jobs ahead so that there is never a driver who has to wait for the next job or a job which is delayed for want of a truck.

The dispatcher sits in his office at the service station and on a large card before him keeps a tally of the whereabouts of every truck. He knows the work so thoroughly that he can judge within a few minutes how much time any given job should take, so that he can tell definitely just when each vehicle can be ready for another job.

It is his duty to see that when a bill of material or a load of coal is to be moved from a certain yard to a given location that a truck is there ready for work. The truck must be there when it is wanted—not a couple of hours later or so soon that it will have to stand waiting for its load. He must try to keep his work so planned ahead that his drivers are kept supplied with orders for jobs to tackle on the completion of those in hand.

Dispatcher Informed of Need

When the manager of a yard finds that he will need a truck for a certain job he immediately telephones the dispatcher at the service station, giving him the time when the truck will be needed, describing the material to be hauled and telling its approximate weight. This is done the day before, if possible, but if not, a truck can usually be procured on less than an hour's notice.

Each driver, when he leaves the service station and garage in the morning receives his orders for the day, or for as much of the day as has been scheduled ahead. The dispatcher knows where he is every hour of the day and before his appointed task is completed word is waiting for him at one of the yards at which he calls for his next job. If this is not possible, he calls up from his last delivery and gets his orders. There is always another job for him and he knows there is a record in black and white, telling exactly what he did that day and how long it took him.

The dispatcher and his assistant are both thoroughly conversant with the work. They have records of what other drivers have done on the same job, so there is no fooling them. Still, there is nothing disagreeable in the system, for it is fair and impartial and proclaims merit no less than it reveals shortcomings in the men.

The United Fuel & Supply Company is an amalgamation of the C. H. Little Co., formerly dealing in building supplies, with the Malcombson-Houghten Co., dealer in a large way in coal and coke, as well as building supplies. There is no small advantage in this arrangement, for while the steam trade in coal continues the year 'round, even it fluctuates in volume, according to whether steam is used for heat or not, in the summer months the residence coal trade practically withers away.

While the volume of coal trade is shrinking, on the other hand activity in building increases. The ground thaws and there is more demand for cement, stone, sand, etc., so that in mid-summer, when the coal trade is at its lowest ebb, the high tide of the building material trade is on.

Combination Ideal

The combination of these two non-competing businesses is therefore ideal, and while it places unusual demands upon the versatility of the equipment, it also assures it practically uniform tonnage to haul.

Both a wholesale and retail coal business is done and the latter embraces both the steam and apartment house trade and private dwelling supply. The building materials handled include practically everything needed for construction ex-

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Hopper storage and chute loading minimize standing delays in the loading operation. The man at the left is operating the loading chute and the driver is ready to drive away as soon as he has the word

cept lumber and hardware, comprising sand, gravel, cement, brick, lime, hair, lath, shingles, roofing, stuccos, stains, ready-mixed mortars, drain tile, sewer pipe and partition tile; considerable of which commodities are produced on the company's own properties.

All Coal Received by Rail

Of the nineteen United yards, four handle coal only, four handle both coal and building materials, and eleven building supplies only. All of the coal is received by rail, the cars being spotted at the eight different coal yards. The supply yards receive some of the material by rail and some by a fleet of fifteen steamboats owned by the concern. There are eight docks at which this material is received, these docks being at yards maintained by the concern, so that there is no trucking of the material from railroad terminals or docks to the yards, but all road haulage is delivery.

Of course all of the yards which handle supplies do not carry sand, gravel, etc., but only those on the waterfront.

These docks are distributed along the river, four being near the business district and four at Delray and River Rouge, suburbs of the city, so that excessively long hauls are not necessary.

Motor truck delivery has been employed by the concern since its inception and by the two firms which combined to form it before that, the first trucks being purchased by the Little and Malcolmson companies in about 1912. The present fleet of forty-four vehicles has been built up gradually and has been modernized from time to time by disposing of the older vehicles. The fleet is composed of Pierce-Arrows and Packards. The Packards comprise 5-ton worm-driven platform trucks, 4-ton worm-driven platform trucks, 4-ton worm-driven dump trucks, 2-ton worm-driven platform trucks and 1-ton worm-driven platform trucks.

The Pierce-Arrows comprise 5-ton platform trucks and 5-ton dumping types.

In addition to these there are four Ford delivery cars used for the service department and the construction department.

The company also uses 400 head of horses and between 200 and 300 wagons.

Roughly, the work is divided according to length of haul and required speed of delivery. The horse wagons serve the close-in districts principally and the trucks take the longer hauls except as indicated below and except where there is a special hurry in which a truck is used if available. The maximum radius served by horse wagons is about 3 miles from any of the yards, and the average distance from them which the horses serve is about 1½ miles. The horse wagons in both kinds of service carry from 3 to 4 tons per load.

All of the delivery for the United company is purely a matter of one-way hauls.

Speed an Important Factor

The advantage of speed which is possessed by the truck causes considerable deviation from the long- and short-haul rule as above outlined because in the congested districts the dumping bodies permit the delivery of coal, sand, etc., much more rapidly than is possible with horse wagons, and where material or fuel is wanted in a hurry, the truck can get it there while the horse wagon is getting started.

Trucks are not used to the fullest that would otherwise be possible, however, because of the narrow alleys in which many deliveries must be made. The trucks are often too wide to permit their



Part of the fleet of twenty-two Pierce-Arrow trucks operated by the United Fuel & Supply Co., Detroit, drawn

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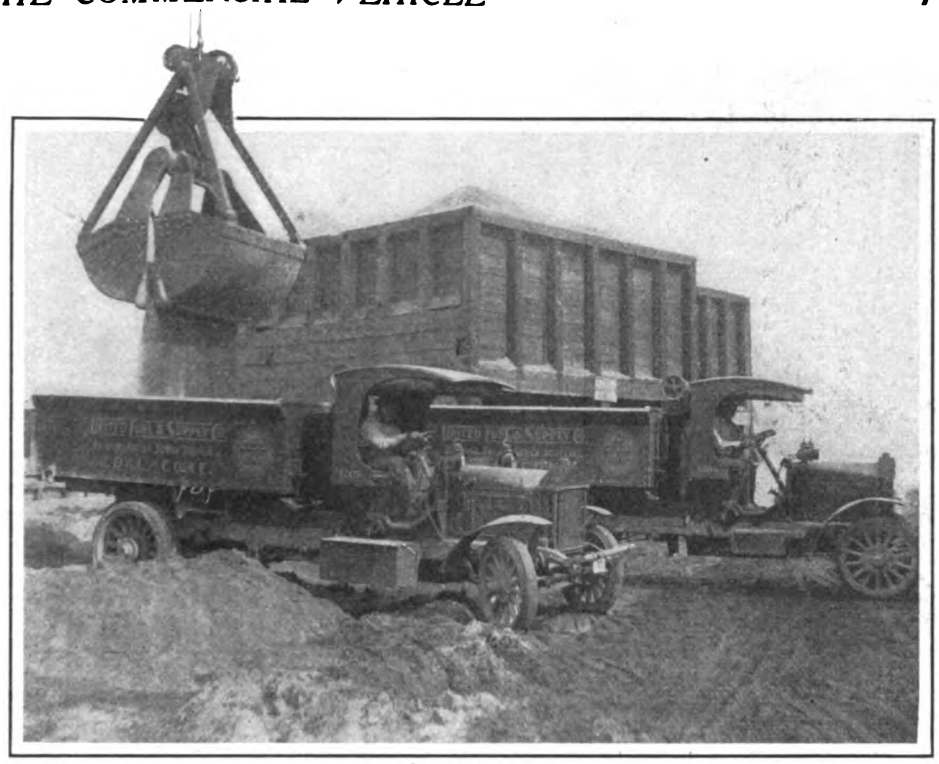
use in these and so the narrower horse wagons have to be used. There are also many cases where structural difficulties would involve long waits which would preclude efficient truck use. Then, too, there are material deliveries in which the only approach to the unloading point is over soft ground or unpaved roads, which, in wet weather, cannot sustain the weight of trucks and so wagons have to be used.

It will be evident from what has gone before that this is not a business of cut-and-dried system, but of constantly new and baffling problems which must be met with good judgment and effective execution. To permit the proper exercise of authority, the management is laid out on an efficient plan.

An executive committee of the board of directors is actively in touch with the business at all times. The chairman of this committee is the company's president and general manager.

Under the general manager are the several different departments, each with an executive accountable directly to him. One of the more important of these is the operating department, which is immediately directed by the company's vice-president. A general superintendent with an assistant has charge of the yards and is responsible in general for the proper reception and delivery of all merchandise and the maintenance of equipment. Automobiles are under the supervision of a manager, who is responsible for their upkeep and efficient use. This involves the operation of the company's main service station and minor garages. This manager with his assistants also directs the disposition of the trucks from day to day and maintains in addition in first-class shape a large number of roadsters and several touring cars which the company uses in its sales department.

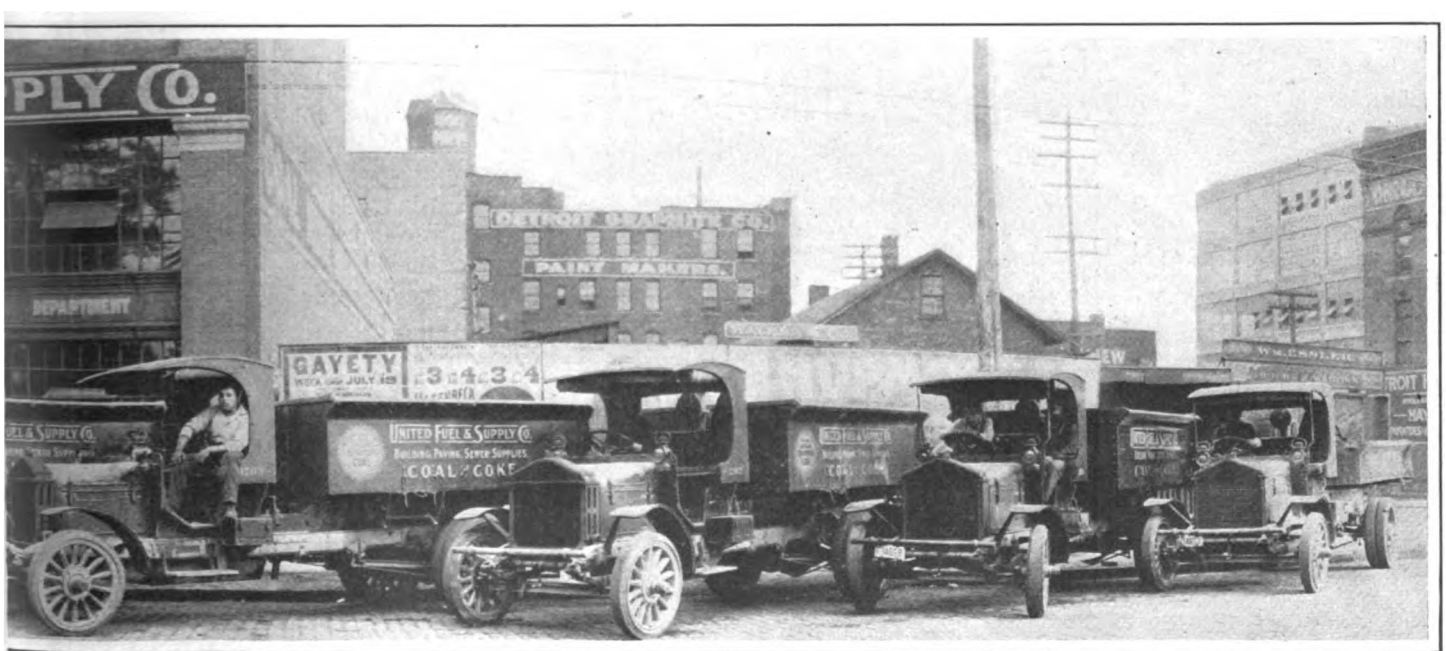
Incidentally, the company has found it advisable to maintain a claim department, notwithstanding it carries almost every conceivable kind of insurance. It has found that attention to the claims by itself in the first instance generally results in a better attitude on the part of the public toward it. Conduct tending to damages and accidents is discouraged, but some are bound to occur. Serial numbering in good-sized figures on all its vehicles has proven very helpful in placing the blame for such mishaps as may happen.



Sand is also loaded by chutes from overhead hoppers, but when there is a special hurry, the clamshell bucket shovels it from piles into the trucks in nearly as short a time and without human labor

Each truck is manned by two men, a driver and a helper, the helper being in some measure an apprentice to the driver. By this means a higher grade of helper is secured, due to the opportunity for advancement which is offered. The drivers are mainly hired as such, for Detroit is perhaps better supplied with men competent to operate motor trucks than any other American city. At least they all seem to be more skillful, and unfortunately more daring, than the writer has noticed in extensive inquiry in other cities of the country. The working day is 10 hours.

The United yards are modern in every particular. Overhead loading of loose material is practically universal. In the coal trade, for example, all coal is taken from overhead hoppers. These are arranged with runways for the vehicles underneath them and running right



up in front of the truck service station. There is an equal number of Packards in the service of this concern

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Unloading bags of cement from a dumping type of truck for the construction of a new building. At the right is shown a pile of hollow partition tile previously delivered

through. Thus there is no backing or switching in getting a truck into position for loading.

The truck enters the yard through a separate entrance gate, is weighed in and proceeds down an incoming alley to the chute containing the particular grade of coal for which the driver has orders. He drives the truck under this chute and the load is chuted into the truck body. When the truck is loaded it is driven straight forward into an out-going alley and directly onto the exit scales, where it is weighed out and leaves by an exit gate.

Whenever possible the load is delivered by dumping into a coal manhole or into a pile. The former are rare, unfortunately, as architects are still oblivious to modern traffic requirements, and the latter course can only be pursued where the customer's consent is secured. Where the coal is dumped into a pile, a wheeling crew accompanies the truck on its first run, carrying shovels and wheelbarrows. These are left on the job and the truck leaves immediately the load is dumped, being picked up later when the job is done.

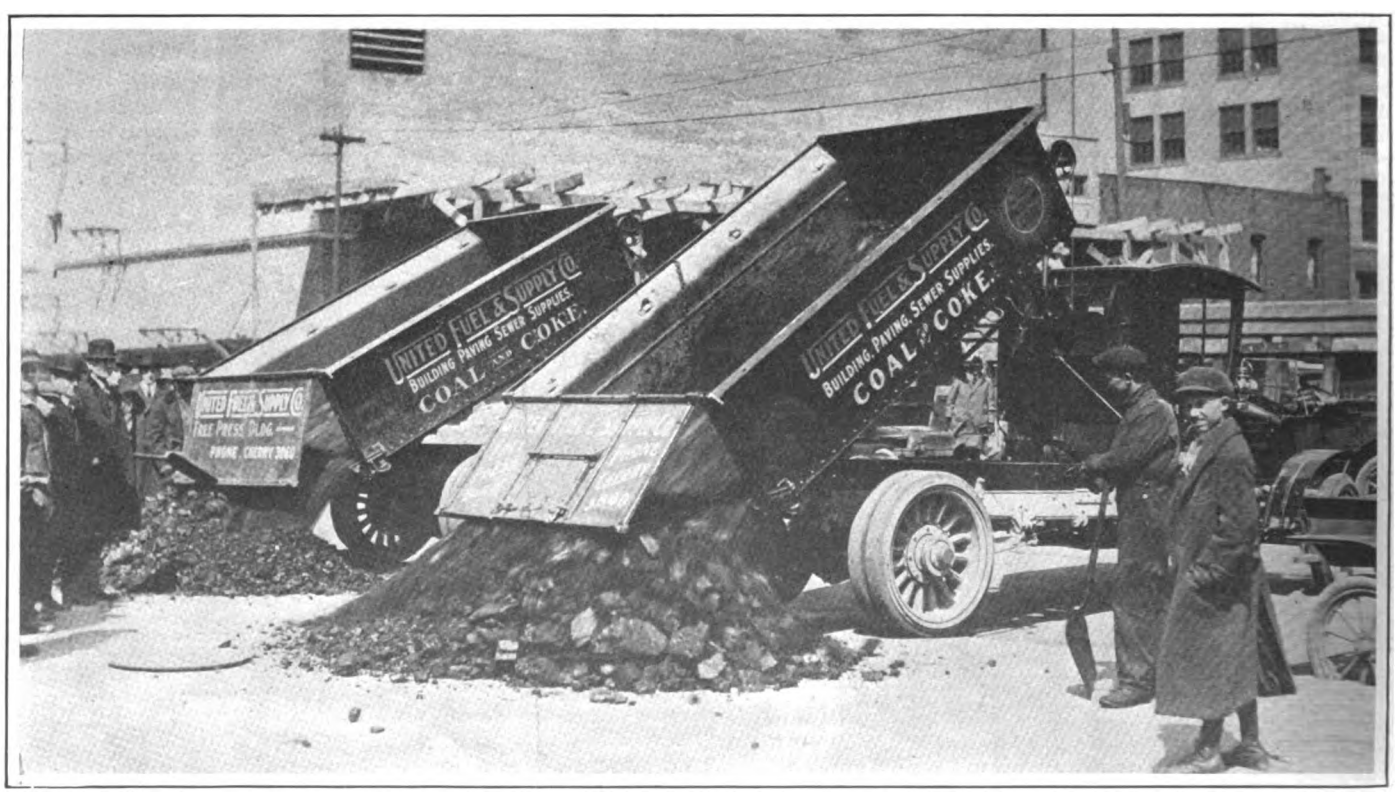
The latter method is the quickest and the cost to the consumer is the same as by the bag method. Many Detroiters prefer the latter, however, as it does not leave a smudge on the street and front lawn. In the latter case, if possible a platform instead of a dumping truck is employed. Fully half of the volume of retail coal delivery is by the bag method. Of course, where there is no platform truck handy, a dump truck may be used to haul the bagged coal.

Motor trucks are not extensively used in retail residence delivery, however, being principally devoted to the steam trade or large orders where several loads must be taken. One reason for this is that the delays occasioned by the poor receiving facilities preclude the efficient use of trucks in this work. The exceptions are where there is a special hurry for the delivery or where the distance is greater than the 3-mile limit fixed for horse vehicles.

There is no extra charge for deliveries over long hauls anywhere in Detroit or its immediate suburbs, but for the more distant points a charge of 50 cents per mile per ton is made.

In the material business the conditions are very similar to those obtaining in the coal business. Here, as in the case of coal, overhead chute loading of such material as sand, stone, gravel, etc., is the rule. Exceptions are made, however, where there is a special rush in which the trucks are sometimes loaded directly from the boats or stock piles by the steam shovel.

The dumping bodies are of steel, fitted with hydraulic hoists and tailboards hinged to the top. These are released automatically as the body tilts. They may be locked shut, if desired, however, and a small sliding door in the rear used for the discharge as in cases where the coal is to be directed into a small manhole or where bags or a wheelbarrow is



How the United company likes to deliver coal. The hydraulic hoist tilts the body in the twinkling of an eye, and the truck is upon its way while it is being lowered again. A manhole is handy for the shoveling crew to stow it away

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UNITED FUEL & SUPPLY CO.

TRUCK DEPT.—DAILY ROUTE CARD

DATE_____191_

1200								1100							
1201								1101							
1202								1102							
1203								1103							
1204								1104							
1205								1105							
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1208								1108							
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1210								1110							

Truck dispatching form which enables the service manager of the United company to keep track of every truck on the job and to assign it jobs in immediate sequence to work called for by the yard masters

to be filled. There are also small trapdoors at the sides which open downward to permit of side discharge into chutes or manholes, the helper in this case feeding the coal with his scoop, within the body.

Platform bodies are provided with low stacked racks which are removable. The dumping bodies are of two sizes, on the 5-tonners the 3-yd. size being intended for sand and the 4-yd. for coal, to avoid overloading when sand or gravel are carried, such as would result were 4 yd. of sand loaded onto a 5-ton chassis.

Proper maintenance of the vehicles is assured by having practically all of them garaged at a central service station, about a mile east of the business section of the city. In this building, which is two stories high, is a large garage space and on the upper floor a complete stockroom for supplies and parts and a machine and repair shop, reached by an elevator from the floor below. The stables are quite separate from the truck service station.

It might be noted in closing that this company aims to use its trucks as a means of advertising. It has adopted a characteristic color for all the trucks with a certain style and color of lettering and on its passenger cars it uses a uniform style of gold lettering. It is the company's aim to keep all vehicles as clean and fresh looking as possible, although in the rush of business this cannot be carried out as fully as desired.

Trucks Save Time in Excavating for New Ford Buildings

AN interesting job in cutting and filling work in which trucks are rendering excellent service is being done by the Hayes Cartage Co. of Detroit in connection with the excavation for the addition on the power house of the Ford Motor Co. In digging the foundation for the enlarged section of the power house it is necessary to remove a total of 15,000 yd. of earth. This work is being done by a steam shovel which removes the dirt and loads it into trucks without interruption.

The haulage work is being taken care of by seven White 5-ton trucks. These are carrying away 6½ yd. at each haul. The round trip is 4 6/10 miles, the trip being 2.3 miles from the excavation to the dump and the same distance back.

The total cost, including the necessary timbering to make an inclined roadway into the excavation, is amounting to about 96 cents per yard, the cost of timbering figuring at about 6 cents per yard. During a working day of 10 hr., eighty-four loads are removed with seven trucks, which means twelve loads per day per truck. With the seven-truck outfit the work is so timed that as one truck is loading the next truck is backing down the inclined timber road to get into position beneath the steam shovel. The shovel makes excellent progress through the clay, so that there is little waiting and lost time.

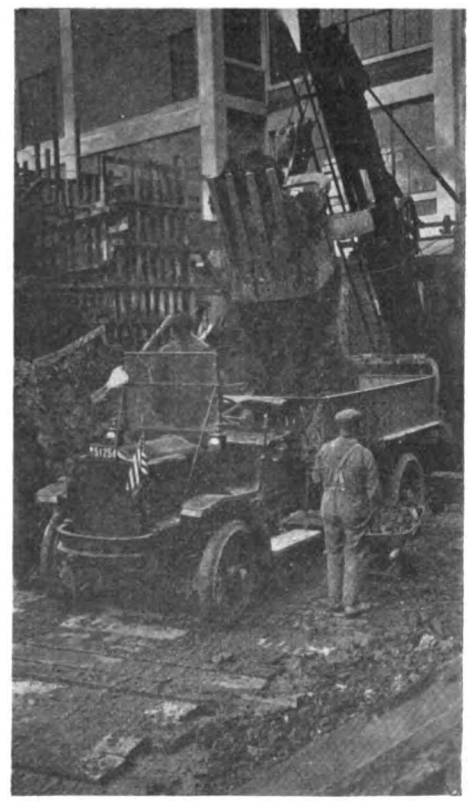
One Man for Each Truck

The men employed total five outside of the truck drivers. There is only one man to each truck, and at the dump there is one laborer engaged in leveling work. To assist in bringing the trucks up the inclined timber road from the excavation to the street level there are a steam boiler and winch.

The White trucks used in connection with this work are practically new, some of them being employed for the first time in this work and a number of them more than one year old. With this method of taking care of the work the time saved over a corresponding job done with horse drays is enormous. Furthermore, the actual cost is many times less than could be done on similar work by means of horse vehicles. According to the figures on this particular job the cost of moving the 15,000 yd. of clay from the excavation will total about $14,400. This is an estimated saving of 250 per cent over what it would cost to do the same job with horses.



Steam shovel filling White 5-ton truck on excavation for addition to Ford power house



A close-up of truck and shovel

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The Unjust 5% Tax

THERE can be no rational reason advanced by the Ways and Means Committee at Washington for placing a war tax of 5 per cent on the selling price of a motor truck.

Chairman Kitchin, of the Ways and Means Committee, has already admitted on the floor of the House that many of the measures of the war taxation scheme are indefensible but that any steps may be taken in time of war to raise war taxes. Nothing could more truly indicate the condition that rules in Washington when urgent matters such as the present war tax measure are being considered. Nothing better indicates how necessary it is for industries to be properly organized and have proper representation in Washington when there is danger of such measures going through.

The automobile is being taxed with a similar 5 per cent measure on the ground that it is a luxury. Apparently the Ways and Means Committee think the motor truck a similar luxury. It is questionable if it has a single clear, definite conception of the motor truck field, the capacity of a truck for work, and its necessity in modern business, not to speak of its super-necessity in the present war.

There has been no effort at any rational distribution or equitable division of these war measures. For example:

While the motor truck is taxed, it is explicitly stated that motor boats, if intended to be used for trade, or yachts intended to be used for trade, are not to be taxed. You could not find a greater inconsistency. You tax a motor truck, which is built solely for trade, and you let the motor boat, built for trade, go free. The motor truck has no more right to pay this 5 per cent tax than has any canal boat, than has any freight steamer on our inland lakes or on our rivers or canals. The motor truck has no more right to be taxed than the freight car on the railroad, or the trolley car.

Look at a few glaring examples of this inconsistency of taxation:

The motor-bus maker must pay his 5 per cent tax, but the manufacturer of trolley cars for interurban use goes free. The manufacturer of all horse-stage line vehicles goes free. The man manufacturing ferries for our rivers goes free. The merchant who uses horse delivery knows that the horse vehicles are not taxed at the source of manufacture, but the merchant across the street using motor deliveries has his vehicle taxed.

It is impossible in any analysis of the situation to discover any moiety of justice in this 5 per cent tax on motor trucks. If a corresponding tax were placed on all other forms of vehicles used in the transportation field, some symptom of justice could be discovered under the rules of comparisons. But none can be found. To require the motor truck manufacturer to pay a 5 per cent tax on his product is the same as requiring the telephone manufacturer to pay a 5 per cent tax on every bit of telephone apparatus he makes because telephone apparatus is a vehicle for faster transportation of words.

In the spirit of equity it is impossible to understand why transportation apparatus should be singled out as a special target for war taxation. In times of war one of the greatest problems is that of transportation. The Allies would have been at the Rhine by this time if transportation means had been on a par with artillery and men. Motor transportation saved Paris in August, 1914. Transportation is the great necessity of to-day, not only in war, but in industrial life. In these days it is the one aspect of a nation that should be maintained in the most healthy condition.

It should be the aim of all taxation in time of war that revenue should be raised from profits and income rather than by taxes on the products entering into the industry. Ideal taxation would be that which will keep our industries in a robust, healthy condition throughout the period of the war so that they will be ready to meet international competition when the war is over. Under no circumstances must industries be crippled by taxation.

The motor-truck industry is one of the great patriotic industries of the country. Already leaders in it have been giving freely of their time to the government in the war program. They are getting drivers for the government, they are examining them, they are co-operating with the government in every way possible. They have no desire to evade taxation, but they ask to be fairly treated in this war measure when compared with other industries of a kindred nature. The motor-truck industry rightfully rebels at being singled out for this 5 per cent tax when other industries in the transportation line are not touched. If you tax one, in justice you must tax all. Transportation means should be among the last arms of a nation's industries to be taxed.

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Truck Exports Gain 50 Per Cent

United Kingdom Was Heaviest Buyer in March

WASHINGTON, D. C., May 7—Reports from all the ports in the United States show shipments totaling $10,030,973 in trucks, passenger cars and parts in March, compared with $6,897,086 in February, and $10,494,365 in March, 1916. There were 1040 trucks exported in March, as compared with 784 in February, amounting in value to $2,961,389, as compared with the February value of $2,128,865. The shipments, however, are not as large as last March, when 1878 commercial vehicles were exported valued at $4,909,179. Over half of these shipments were made through New York, where $6,258,549 worth of trucks, cars and parts were shipped in March. Passenger car exports were increased nearly 66 2/3 per cent, while truck shipments were increased over 50 per cent.

The United Kingdom was our biggest buyer in March, her purchases increasing over $1,500,000. Canada doubled her purchases during March, the total exports to that country being $1,208,655, compared with $526,767. Chile was our biggest buyer in South America, showing a large increase over the previous month. Argentina and Brazil also showed substantial gains. Australia tripled her purchases, being third largest in point of American automobile and truck purchases, which totaled $365,527, compared with $127,388 in February.

France and Russia fell off considerably in their purchases of American cars, France especially. Whether the large increase in English shipments has anything to do with the decrease in France is probable, but it is possible that many of the English trucks are shipped over to France. Russia fell off in the total value, but held the number of its purchases up to February's mark.

For the 8 months ending March, the United States shipped $85,614,953 worth of automobiles, trucks and parts, compared with $89,723,953 in the corresponding period in 1916. Though the value decreased, the number of cars and trucks are practically the same, there being only a difference of three for the 8 months, the balance being in favor of the 1916 period, when 55,140 were shipped.

U. S. TO STUDY FAR EAST MARKET

WASHINGTON, D. C., May 7—Reports on the need for motor vehicles in the Far East will be available for American manufacturers as a result of the study to be made of that territory by Tom O. Jones for the United States bureau of foreign and domestic commerce. The particular points investigated with regard to trucks will be as to the size that will have the biggest demand; the preference for bevel gear, worm, chain, or internal gear rear drive; the demands for transmission as to location and number of speeds; the climatic conditions regulating cooling; the makes or types of carbureters and magnetos preferred; the lighting requirements; the facilities for building bodies; the need and type of tractors or trailers desirable.

S.K.F. AND HESS-BRIGHT UNITE

NEW YORK, May 9—Plans have been perfected for a closer co-operation between the S.K.F. Ball Bearing Co. and the Hess-Bright Co., by the formation of the S.K.F. Administrative Co., No. 1 Wall Street.

The affairs of the two companies will be administered by the S.K.F. Administrative Co. The board of this company consists of Frank A. Vanderlip, president of the National City Bank, Thatcher Brown of Brown Bros., F. B. Kirkbride, S. Wingquist, Marcus Wallenberg, a banker in Sweden, Axel Carlander, and B. G. Prytz, who as president of the S.K.F. Ball Bearing Co. has been active in bringing about the fusion between his company and the Hess-Bright company. Mr. Prytz has been elected president of the Administrative company.

U. S. TRUCK SALES $1,746,000

CINCINNATI, OHIO, May 7—The United States Motor Truck Co. sold $1,746,000 worth of trucks in the first quarter of this year.

STEEL SCARE UNWARRANTED

NEW YORK, May 9—The motor vehicle industry is in no danger of losing its steel supply. The sensational daily newspaper reports of a few days ago will not bear the light of careful examination.

It is not only a question of whether the Government would be willing to paralyze one industry for the speeding up of another, but it is a matter of the ability of the different industries to absorb steel.

General Motors Will Make Tractors

Has Purchased a Number of Patent Rights

DETROIT, May 5—General Motors Co. is preparing to make tractors on a large scale. W. C. Durant, president of the company, visited Pontiac this week for the purpose of viewing the operation of a tractor in the $1,500 class, which will be made by the General Motors Truck Co.

The General Motors Co. has purchased a number of tractor rights within the past few months and plans to manufacture them in the different plants of its organization. Mr. Durant states that he will develop the tractor business as rapidly as the demand necessitates.

Motor Vehicle Makers Protest Tax

Claim Proposed Class Legislation Is Unfair

NEW YORK, May 7—Official protest by the majority of motor vehicle makers in the country against the proposed war taxation of 5 per cent on the total sale of their products has been made to the members of Congress through the National Automobile Chamber of Commerce. The industry expresses itself willing to bear its share of the war burden in common with the rest of the country, but it objects to being singled out for class legislation. Alfred Reeves, general manager of the chamber, has been in Washington to represent the interests of the motor vehicle makers.

The proposed tax was first brought before a subcommittee of the House ways and means committee as a part of the war revenue bill.

It has been approved by the ways and means committee of the House and referred to the finance committee of the Senate, where a hearing was held Saturday, May 12. Alfred Reeves spoke for the automobile industry.

The points brought out by the N. A. C. C. protest are as follows:

Motor vehicle makers without exception desire to pay their full fair proportion of the taxes necessary for the prosecution of the war, but they object to being singled out for special taxation.

The industry includes approximately 450 manufacturers, of which twelve makers produce 80 per cent and 438 produce 20 per cent of the whole. The twelve have been prosperous while the bulk of the others are able to exist only in good times.

The volume of sales has been decreased since the war. Increased prices would further restrict the volume of sales. Hence the maker would have to bear the full weight of the tax, which would cripple the majority of the small and financially weak companies.

Labor costs have increased 25 per cent and more in the past year or two. Materials have increased anywhere from 30 to 400 per cent. These rises in the cost of production have been met because of the large volume of sales which the war is curtailing.

In crippling the motor vehicle industry 825 parts and accessories makers, 25,924 dealers, and 23,686 garages would also be affected.

Few of the manufacturers show over 12 per cent profit on their turnover. This tax, assuming that it could not be passed on to the consumer, would take 5/12 of the profits or be a 41.6 per cent tax on the net earnings of the industry. Very few of the manufacturers after paying this 5 per cent would have anything left to pay under the excess profits tax. Their net earnings, if any, would be less than 8 per cent on their investment. More than 600 motor vehicle manufacturers have failed during the past five years.

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P. O. Dept. Opens Truck Bids

To Extend Motor Service on Star Routes

WASHINGTON, D. C., May 7—The Post-office Department has rejected all bids furnishing trucks of 750 lb. capacity. Sealed proposals for furnishing these chassis as they may be ordered for use of the postal service will be received until 10 a. m. May 16.

J. A. Edgerton, purchasing agent of the department, has given notice that in addition to other specifications trucks to be purchased for post office service in the future shall include this equipment:

Two electric or gas headlights equipped with dimmers, two oil side and one oil tail lights, one mechanical or electric horn, one hub odometer of type approved by the department to be attached to left front wheel, one jack, one set of anti-skid chains of approved design and appropriate for size of truck, one standard set of tools. Side oil lamps to be one piece heavy steel body, double supports, combination socket, round body. Tail oil lamp to be one piece heavy steel body, left hand single support, combination socket, round body.

The department is also contemplating the extension of motor service in the near future to all star routes it controls, motor service now being very generally in use in the rural free delivery service.

WASHINGTON DELIVERY COSTS HIGH

WASHINGTON, D. C., May 12—Retail delivery costs more than railway transportation in the city of Washington, according to census bureau reports. Answers to queries on this point were filled out by 128 companies in the city, showing that 6.2 per cent of the gross sales was spent for retail transportation. The cost for groceries was 4.4 per cent, for milk 12.1, for bakery products 19.8, for ice cream 14.9, for ice 45.6, for coal and wood 15.2, for laundry 20.3. The census bureau states that these figures represent a fair average for American cities.

METZ MAY MAKE TRACTOR

WALTHAM, MASS., May 3—Experiments with a Metz farm tractor on land adjoining the company's plant here lead to the expectation that the company will enter upon the manufacture of tractors. A standard Metz chassis is the basis of the new device, altered only in respect to its wheels. A two-blade plow of the Deere type was used.

CLEVELAND OFFICES OPENED FOR STANDARD PARTS

CLEVELAND, May 5—Executive offices of The Standard Parts Co. were opened the past week in the Hickox Building. Only the central organization will be in this location. The forces in charge at the several factories, embracing the plants of the former Perfection Spring Co., Standard Welding Co., Western Spring & Axle Co., and Bock Bearing Co., are not directly affected by the opening of these headquarters and will for the most part remain without change. Its twelve factories employ 8000 people and a working capital of about $22,000,000.

Besides President Christian Girl, there will be at the executive headquarters the offices of Dan C. Swander, general sales director; J. G. Utz, director of engineering; Horace H. Newson, director of purchases; J. H. Liston, manager of jobbing department; E. R. Finkenstaedt, assistant to the president, and James A. Braden, special publicity. An auditor, yet to be announced, will for the present complete the executive office personnel. Secretary P. A. Connolly will continue his headquarters at the Perfection Spring division plant.

RECORD SALES FOR MAXWELL

NEW YORK, May 3—Maxwell Motor Co. sales for the first 3 months of this year were 58 per cent larger than for the same period last year. The output is now 350 vehicles a day.

STEWART ADDS 2-TON TRUCK

BUFFALO, N. Y., May 8—The Stewart Motor Corp. has added a 2-ton truck to its line, known as Model 7. This brings the number of models up to four, the others being respectively of 1500-lb., 1-ton and 1½-ton capacity.

The addition of the new model is in accordance with the Stewart policy to make a complete range of trucks. The new model sells for $1,975 f.o.b. Buffalo, with lead finish, $20 extra for painting.

Some of the leading specifications include Buda 4½ by 5½ engine, Fuller unit powerplant clutch and gearset, Celfor internal-drive axle, and a 156-in. wheelbase. The truck is featured by its parallel straight-line frame and the use of Bound Brook oil-less bearings, reducing the number of grease cups to nine.

Among the important accessories used are the Zenith carbureter and the Berling magneto.

Coming Events

May 15	Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.
May 16	New York City, Monthly Meeting of the Motor Truck Club of America at Noontime.
May 16	Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.
May 17	New York City, Monthly Meeting, Metropolitan Section S. A. E. Automobile Club, 247 West Fifty-fourth Street.
May 18	Cleveland Sectional Meeting S. A. E.
May 24	Detroit, Sectional Meeting of the S. A. E., Hotel Ponchartrain.
May 25	Indiana, Sectional Meeting S. A. E.
June 26-27	New York City, Summer Meeting S. A. E. Bureau of Standards.

American Trucks Serve Well in France

George Sweet of United Motors Reports Conditions

GRAND RAPIDS, MICH., May 3—George Sweet, vice-president of the United Motors Co. of this city, has returned from France with interesting information on aeroplanes, trucks and cars. Mr. Sweet visited France only, but made several flights while there and has an intimate knowledge of the conditions. There are 40,000 trucks on the French front, according to Mr. Sweet, 10,000 of which are driven by competent drivers, 30,000 of which are handled by men who lack a driving experience. Trucks are being used for ammunition, supplies, transporting soldiers and for carrying large searchlights with dials 3 ft. in diameter. These searchlights are for detecting aircraft.

All of the trucks excepting those carrying searchlights are equipped with bodies similar to the old prairie schooner. The popular sizes are 3 and 5 tons. Many trucks are mounted with 75 mm. guns. All trucks are provided with folding seats to be used for either carrying soldiers or freight. The trucks in back of the line are painted gray with green tarpaulins; in the front lines they are armored and carry long-barreled anti-aircraft guns. They are painted with blotches of yellow, green, brown and purple, so arranged as to make them look like foliage from the airplanes. Guns with 25 ft. barrels are carried on three trucks and the barrels and trucks are also so painted.

American trucks are holding up well. They are plentiful but not as numerous as the foreign makes. The French truck factories have increased their production tremendously and are now turning out 250 to 300 trucks per day.

J. F. FIELD CO. EXPANDS

ALMA, MICH., May 7—The J. F. Field Co., truck bodies, will build a one-story factory and office building, 60x300 ft.

DIVIDENDS DECLARED

DETROIT, May 5—Maxwell Motor Co., quarterly of $2.50 per share on common and $1.75 per share on preferred, payable July 2 to stock of record June 11.

AKRON, OHIO, May 3—Payment of the usual quarterly dividend of 1 per cent on the common stock of the B. F. Goodrich Co. was authorized at a meeting of the directors on April 25.

NEW YORK, May 3—Gaston, Williams & Wigmore, Inc., international dealers in motor vehicles and accessories, have declared a dividend of $1 on all stock recorded at the close of business May 1. Checks will be mailed May 15.

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Redden and Cook Ask Injunction

Allege Smith Motor Truck Co. Infringed Patents

CHICAGO, May 5 — Another development in the patent controversy among truck-forming makers has been made through the petition of the Redden Motor Truck Co. and Albert E. Cook, owner of the Cook truck-forming patents, in the United States district court here for an injunction ordering the Smith Motor Truck Co. to discontinue manufacturing Form-A-Trucks. Infringement of the petitioners' patent rights is alleged.

This petition is another step in the suit brought last August in the United States district court in Chicago by Cook and the Redden company, in which infringement of the Cook patents is claimed. The suit is still pending. The Smith company filed suit in October in the circuit court of Cook county to restrain Cook and Charles W. Hills, attorney for Cook and the Redden Motor Truck Co., from representing that they have a valid contract under which the Smith company has agreed to pay royalties for operating under these patents.

UNGER SUES HUDFORD

PHILADELPHIA, PA., May 5—Suit was started recently in the Common Pleas Court by Frederick W. Unger for the recovery of $205,000 alleged to be due for his work in financing the Commercial Unit Co., Philadelphia, maker of the Hudford unit.

NO RECEIVER FOR GIBNEY TIRE

PHILADELPHIA, May 7—Stockholders of the Gibney Tire & Rubber Co., Conshohocken, successfully opposed an effort by council to have the Federal Court appoint a receiver for the company recently. At this hearing before Judge Thompson it was alleged that the resolution of the Board of Directors admitting insolvency was illegally procured.

AUTOCAR PRICE INCREASE

ARDMORE, PA., May 3—The price of the Autocar chassis has been advanced from $1,650 to $1,815.

G. M. PROFITS $18,750,000

DETROIT, May 4—The General Motors Co. has undivided profits for the 8 months ending March 31 of approximately $18,750,000, as compared with $17,624,117.03 for a similar period of the preceding year.

FEDERAL DEALERS WILL CARRY PARTS

DETROIT, May 12—All dealers in Federal trucks will in the future be required to carry in stock a complete assortment of service parts. This clause has been inserted in Federal Motor Truck Co. contracts with the selling organizations in order that the buyer may be assured of full service from his truck and will be able to have it repaired immediately when necessary.

BESSEMER RE-FORMS IN DELAWARE

DOVER, DEL., May 7—The Bessemer Motor Truck Co., which has been incorporated in Pennsylvania with a plant at Grove City, in that State, has been incorporated under the laws of Delaware, with a capital of $2,000,000. The change in State was made because the Delaware laws are more liberal and would permit the company to build homes for workers or any other improvements and adjuncts to their plant, which would not be possible under the Pennsylvania charter.

STUDEBAKER PLANS NEW PLANT

SAGINAW, MICH., May 5—The Studebaker Corp. of America is making plans for a large assembling plant at Saginaw which will employ about 200 men.

NEW N. Y. DEALER LAW

NEW YORK, May 7—The Legislature in Albany has passed the Hewitt bill. It has been signed by the Governor, becoming effective February, 1918. The dealers are in favor of it.

The measure has to do entirely with the issuance of license plates to dealers and their use of them. The salient features of the new measure follow:

Annual fee of $15 for dealers, with a charge of $5 for each additional set of plates (additional plates now cost $2.50).

Limits the number of plates to each dealer to five sets, including the original set, and permits application for additional plates to be acted on by the Secretary of State.

Prohibits dealers driving cars with dealers-plates on them for private purposes, for pleasure or for hire.

Permits the issuance of duplicate plates for any that are lost or destroyed upon the filing of an affidavit.

Limits the use of dealer plates by purchasers of new cars to five days instead of 15.

Under the new bill, 1918 dealer plates will indicate on them the number of sets issued to each dealer. For example, the original plate might be M171; additional plates would be numbered M171-2, M171-3, -4, -5. This is done to assist in the identification of dealer cars which are operated in such a manner as to violate any of the traffic rules, etc.

When purchasers of new cars borrow plates from the dealer, the dealer must file a statement with the Secretary of State, giving the date and name and address of the person to whom the plates were loaned. The owner must also file a statement with the Secretary of State.

BLOCK EXTRA TAX ON N. Y. TRUCKS

NEW YORK. May 12—Proposed measures to double the tax on commercial vehicles in New York State as a war revenue were blocked through the efforts of the Motor Truck Club of America, which showed that trucks already paid a much higher fee than other vehicles. Accordingly commercial vehicles were exempted in the bill, which doubled the current registration fee for passenger cars.

California Legislators Compromise

Motor Vehicle Interests Block Confiscatory Bill

LOS ANGELES, May 5—Following the most prolonged and embittered fight for reasonable motor vehicle legislation the State ever has seen, the Johnson-Finlay "conference" bill is now ready for passage by the legislature. To prevent the enactment of a measure that would have been confiscatory in its nature as relating to commercial vehicles, truck dealers and owners of the State were forced to go to extremes. Thousands of dollars were spent in attorneys' fees, telegrams, mailing lists and advertising.

No less than six separate and distinct bills found sponsors in the legislature. Three of these were so similar that a conference of all interests, including owners and dealers, was held and a "conference" bill presented.

The following are the important provisions of the new laws:

Certificates of registration to be furnished automobile owners, at the State's expense. These are to be displayed on the car.

Warning signs on approaches to railroad crossings to be erected by supervisors, boards of trustees or local governing bodies.

No dimmers required. Focusing system, as recommended by the Society of Automotive Engineers, so that no beam of light is reflected more than 42 in. above the ground, adopted as standard.

Number of trailers limited to two. Rear trailer must carry duplicate license plate for which annual fee of $2 will be charged. Trailers must display lights.

Operators of cars must have annual license, but no fee required therefor.

No age limit is set for operators, but application of minors for operator's license must be indorsed by parent, guardian or employer, who is jointly and severally responsible for action or damage.

Speed limit for trucks determined by weight. Width of bodies used on vehicle limited.

Ten mile limit for driving over bridges repealed, but highway commission given power to post speed limits for certain bridges for the purpose of protecting public and structures. This limit may vary from general speed requirements.

Revocation of license automatic where driver is convicted of driving when under the influence of liquor to the extent that he cannot properly operate car, or where he has been convicted of speeding three times in one year. In addition, the highway commission may summon a driver for a hearing on charge of reckless driving or where representation is made that driver is physically incapacitated from handling a car.

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Besserdich Forms New Truck Company

To Build Double Drive Light Delivery Vehicle

CLINTONVILLE, WIS., May 5—William A. Besserdich, one of the founders of the Four Wheel Drive Automobile Co., has organized the Wisconsin Duplex Auto Co., with a capital stock of $500,000, to manufacture a new type of double-drive utility car. It is said the new product will be a light delivery type which will be made in large quantities and sold at a comparatively low price. The maximum capacity probably will be kept at 1 ton. It is also said that plans of the new company contemplate the issue of a passenger car type.

Fifty per cent of the stock in the new concern already has been subscribed, and a permanent organization has been effected by the election of the following officers: President and chief engineer, William A. Besserdich; vice-president, A. S. Larson; secretary and manager, B. A. Mosling; treasurer, J. P. Mosling; directors, the officers and J. H. Frank.

A factory will be established as soon as possible, the definite location depending upon inducements offered by cities desirous of obtaining the new industry. For the present a shop and offices will be maintained at Clintonville, which may be made permanent.

A feature of the new product will be the ball-and-socket joint unit in the duplex transmission system. This is a new design by Mr. Besserdich and B. A. Mosling.

Mr. Besserdich and F. A. Zachow, who operated a machine shop in Clintonville for many years, designed the four-wheel-drive system which is incorporated in the present F. W. D. truck.

COLLIER NOW IN SANDUSKY

PAINESVILLE, OHIO, May 12—The Collier Truck Co. has moved to Sandusky, where it is at present operating in a section of the buildings owned by the Sandusky Forge Co.

UNITED MOTORS SALES $23,500,000

NEW YORK, May 2—Gross sales of the United Motors Corp., for the 9 months ending March 31, totaled $23,500,000, as compared with $17,200,000 for the same period ending March 31, 1916.

BATAVIA PLANT FOR CURTIS FORM-A-TRACTOR

BATAVIA, ILL., May 7—The Curtis Form-A-Tractor Co., Chicago, will open a plant here. The abandoned plant of the Batavia Engineering Works will be occupied. An enlargement will be made, as the Chicago company requires 60,000 sq. ft. of space. Machinery will be removed to Batavia at once. The company will employ 100 men at the outset and will increase this number as the needs of the business require. It is desired to have the plant in operation about June 1 or as soon thereafter as possible.

J. C. WILSON CO. REMODELS PLANT

DETROIT, May 7—The J. C. Wilson Co. has completely remodeled the executive offices and the assembly floors of its motor truck plant.

The company has recently sold a considerable amount of stock and is using the receipts for expansion purposes. The expansion was necessitated by the addition of 1 ton and 3½ ton models.

SMITH FORM-A-TRUCK ANNOUNCES TRACTOR

CHICAGO, May 7—In addition to the Smith Form-a-Truck the Smith Motor Truck Corp. now plans to turn out a Form-a-Tractor for attachment to a Ford car. It consists of a channel section frame which attaches to the Ford front axle, extends under the chassis beyond the rear axle, and is connected with a dead tractor axle made of 2 in. rolled steel which is designed to receive two tractor wheels.

NEW YORK BUYS 34 GARFORDS

TOLEDO, OHIO, May 7—One of the largest commercial car sales of the year has been secured by the Garford Motor Car Co., which will supply 34 tractors for the street cleaning department of the city of New York.

RAINIER SECURES NAVY ORDER

FLUSHING, N. Y., May 12—Twenty-seven half-ton, worm-drive Rainier trucks with express bodies have been ordered of the Rainier Motor Corp. by the United States Navy Department to be used in various navy yards throughout the country. Five of these have been delivered to the Philadelphia navy yard, and two to the San Francisco navy yard. The Rainier bid was not the lowest presented.

MASSEY RECALLED FOR SERVICE

CINCINNATI, May 7—Lieutenant F. B. Massey, transportation engineer of the United States Motor Truck Co., has been recalled for service by the government and has reported to the Boston navy yard.

Pages 16 and 17
This Issue
Will Save Money
for You

Reo Almost Trebles Truck Output

4,566 Trucks Made to April 18—Much Material on Hand

DETROIT, May 7—The Reo Motor Car Co., up to April 18, turned out 15,055 passenger cars and 4,566 trucks, compared with 13,557 passenger cars and 1566 trucks in the corresponding period in 1916. The gross sales of the current year to April 19 showed an increase of $2,440,730.34 or 15 per cent over the corresponding period last year. The company is amply supplied with all materials.

ENGINEERS URGE FEDERAL CONTROL

NEW YORK, May 7—The Military Engineering Committee of New York, representing in its membership the national engineering societies of the United States, has gone on record in favor of federal control of engineering units. It is urging voters to recommend this resolution to members of Congress:

Whereas in any large army to be created for the war, engineer troops will be needed in large numbers, and

Whereas they should be officered by skilled engineers only, and

Whereas the composition and training of such troops differ so much from the composition and training of non-technical troops that they should be organized under one central authority rather than under many scattered authorities,

Now, therefore, be it

Resolved, That the members of the Senate and House of Representatives be requested to insist that all new units of engineer troops be organized and maintained by the War Department and not by the individual States.

PACKARD AIDS RED CROSS

DETROIT, May 5—More than 75 per cent of the 9000 employees of the Packard Motor Car Co. contributed $8,824 to the fund of the Detroit Chapter of the Red Cross. This is the largest single contribution received by the Detroit chapter.

GUARANTY SECURITIES PAYS 2 PER CENT

NEW YORK, May 2—A dividend of 2 per cent has been declared by the Guaranty Securities Corp., an organization which makes a specialty of financing the purchase of motor vehicles.

STUDEBAKER DIVIDENDS PAYABLE MAY 19

SOUTH BEND, IND., May 2—The Studebaker Corp. quarterly of one and three-quarters per cent on preferred and two and one-half per cent on common is payable May 19.

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Fuel Shortage Serious in England

Truck Business Disorganized by Lack of Gasoline

LONDON, May 2—Lack of gasoline in England has practically disorganized the motor car and truck business here. It is predicted that few privately-owned cars will be running by the end of May, when all existing licenses for gasoline will expire. After that date no new licenses to purchase this fuel will be issued except in cases of national importance. Up to that time the average motorist can buy from 8 to 16 gal. per month.

ELECTRIC VEHICLES GAIN IN ENGLAND

NEW YORK, May 2—Electric vehicles have gained in popularity in England since 1914. At the beginning of the war there were 150 electrics in use in that country and now there are 858. The cause of the increase, according to A. Jackson Marshall, who is secretary of the electric vehicle section of the National Electric Light Assn., is the abundance of coal in England and the scarcity of gasoline, which makes the electric current cheaper than gasoline.

FREIGHT RATES UP 15 PER CENT

NEW YORK, May 3—At least a 15 per cent raise in freight rates will become effective June 1. The higher schedule has been authorized by the Interstate Commerce Commission and still further advances are likely as a result of the proposed war revenue measures now before Congress.

TAYLOR ASSETS FOR SALE

NEW YORK CITY, May 14—The assets of the R. E. Taylor Corp. are for sale as per the following auctioneer's notice:

In the District Court of the United States for the Southern District of New York. —In Bankruptcy.—In the matter of **R. E. TAYLOR CORPORATION** and **GRAMM CO.**, Bankrupts.—Chas. Shongood, U. S. Auctioneer for the Southern District of New York in Bankruptcy, sells Thursday, May 17th, 1917, by order of the court, at 10 a. m., at 614 West Fifty-seventh Street, and on Friday, May 18th, 1917, at 10 a. m., at 1457 Broadway, Brokaw Building, Borough of Manhattan, assets of the above bankrupt, consisting of thirty-one brand new Gramm-Bernstein trucks unused, capacity 1 to 6 tons, and twenty other make trucks and touring cars, new repair station machinery, office furniture, etc., and office furniture and fixtures belonging to the Gramm Co., will be sold May 18th at 1457 **Broadway.**

Property can be inspected any day before the sale.

EZRA P. PRENTICE, Receiver.
BLAU, ZALKIN & COHEN, Attorneys for Receiver, 170 Broadway, New York.
Open for inspection from 10 a. m. to 4 p. m. on May 15 and 16.

TRUCK CLUB ADDS 200 MEMBERS

NEW YORK CITY, May 14—Two hundred new members were added to the Motor Truck Club of America as a result of a 4-day intensified campaign carried on by ninety of the present club members who formed themselves into thirty committees of three each and personally invited prospective members to join the club.

Many of the committees reported that they could not secure memberships in some instances because those in authority were not in their offices. As a result of this those prospects who are considered good will be followed up during the following week and one additional day, Friday, May 18, will be given over to a last intensified effort to bring all such prospective members into the club. It is estimated that this work will result in 500 new members before completion.

Largely increased membership is necessary for the club if it is to properly carry on the work of organizing committees to recruit drivers for Uncle Sam's first forty motor truck trains and to hire counsel to direct legislation in New York City and State along constructive rather than restrictive lines.

ANOTHER MOTORIZED CIRCUS

NEW YORK CITY, May 14—The R. T. Richards Supreme Show of the World—a consolidation of several small wagon shows, which makes its way around the country on its own wheels instead of using railroad transportation, has partly motorized its outfit.

The Richards Show management has bought five 1-ton, six 2-ton and five 3½-ton Selden chassis. These will be mounted with fancy hand-carved bodies.

These trucks will operate in three units, namely: the Advance, the Flying Squadron, and the Paraphernalia Unit.

Ample provision has been made for mechanical accidents, as two complete sets of parts will be carried at all times. The trucks will be driven by experienced drivers and repaired by expert mechanics. The Richards Show will start from Oakridge, N. J., May 10, and work up through Vermont and thence south to Florida, Cuba and Venezuela. As the show is an all year one the entire forthcoming winter will be spent in Venezuela.

TRUCKS HELP CAR SHORTAGE

PITTSBURGH, PA., May 3—Motor trucks are helping to relieve the freight congestion which is prevalent throughout the country. Deliveries of farm produce are being made by commercial cars over the Lincoln Highway; and a truckload of tires was recently dispatched from Akron, Ohio, to Boston, Mass. Dyestuffs are being shipped from Providence, R. I., to Kansas City, Mo. The American Railway Association reports a shortage of 143,059 freight cars.

WHITE BOARD RE-ELECTED

CLEVELAND, May 7—The retiring directors of the White Motor Co. were re-elected at the annual meeting of the stockholders. At the organization meeting of the board of directors, the same organization was continued by the re-election of the present officers of the company.

The directors are as follows: M. B. Johnson, Windsor T. White, Walter C. White, E. W. Hulet, A. P. Warner, Otto Miller, J. R. Nutt, J. H. Harding, Theo. Roosevelt, Jr., E. R. Tinker and A. M. Hall, 2nd.

The officers follow: M. B. Johnson, chairman of the board; Windsor T. White, president; Walter C. White, first vice-president; E. W. Hulet, second vice-president; A. R. Warner, secretary, and Otto Miller, treasurer.

Truck Driver Recruits Come Slowly

182 Enlist in Central Section Dept. of the East

NEW YORK CITY, May 14—One hundred and eighty-two truck drivers is the total enrolled into the Enlisted Reserve Corps, Quartermaster Department, Central Section, Department of the East, up to and including Saturday, May 12. Of this number approximately 120 have been recruited through the efforts of the Motor Truck Club of America in New York City and its environs. The remaining sixty-two have been recruited through the efforts of the civilian committee formed by the Motor Truck Club and working in Philadelphia, Pa., under the chairmanship of C. A. Musselman.

The large amount of publicity given to this commendable work on the part of civilians has resulted in scores of inquiries from men who would like to offer their services as truck drivers but who live out of the territory of the Department of the East, the only section where any organized work has been done along these lines. Such men living in Ohio, Indiana, Illinois, Missouri, Iowa, Minnesota, Wisconsin, Nebraska, South Dakota and North Dakota should address the Department Quartermaster, Central Department, Federal Building in Chicago.

In the Central Section of the Department of the East, which includes the states of New York, Pennsylvania, Delaware, Maryland, Virgina and West Virginia, committees are now working in New York City and Philadelphia, Pa. Other committees are in the process of formation in Albany, Syracuse and Buffalo, N. Y., and in Newark, N. J. The Philadelphia committee is arranging to open sub-committees in Baltimore, Md., and Harrisburg, Pa. Metropolitan applicants should address the following committee members:

George H. Pride, chairman, 47 West Thirty-fourth Street, New York City.

Joseph Husson, Secretary and Executive Officer, Editor, THE COMMERCIAL VEHICLE, 239 West Thirty-ninth Street, New York City.

Those living in the six New England states who are desirous of enlisting should address the following:

Major Harry G. Chase, Chairman, 930 Commonwealth Avenue, Boston, Mass.

Captain F. J. Burnham, Secretary and Executive Officer, 30 State Street, Room 406, Boston, Mass.

The ranking officers of the Philadelphia committee are:

C. A. Musselman, chairman, Forty-ninth and Market Streets, Philadelphia, Pa.

Charles A. Porter, Jr., Secretary and Executive Officer, 804 Liberty Building, Philadelphia, Pa.

Those living in the Southeastern Section of the Department of the East, which includes North Carolina, South Carolina, Georgia, Alabama, Kentucky, Florida, should address:

Asa G. Candler, Jr., chairman, 222 Candler Building, Atlanta, Ga.

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Better Truck Maintenance and Repair

Send Us Your Ideas

Make a rough pencil sketch of some good motor truck repair or maintenance method you have made or employed and mail it to us with a short letter telling how you did it

Precour Makes Ford Engine Supports Stronger

F. E. PRECOUR, manager of the truck department of the J. M. Horton Ice Cream Co., New York City, operates sixteen converted Ford cars for the delivery of ice cream. The greatest trouble which he has experienced with these adapted vehicles is the breakage of the Ford engine supports. These supports are made out of stampings ⅛ in. or less in thickness and have broken in the bend where they change from a vertical position as attached to the Ford crankcase to the horizontal position where they are attached to the frame. These breakages became so frequent that Precour was forced to devise some means to strengthen the brackets and evolved the simple method shown in the sketches on the opposite page.

This consists of brazing short pieces of ½-in. iron rods to the support to form a hanger approximately 7/16 in. thick, especially strong in the bend where breakage occurred.

Four pieces of rods are used for each bracket; two of these are alike and considerably longer than the two remaining pieces. The long piece is first laid into the bend of the bracket, while the crankcase is inverted on the workbench. Then by means of an oxy-acetylene torch, the rod is heated at the bend, so that it fits the bracket exactly. Then by means of the torch and a bar of brass dipped in brazing flux the open spaces around the iron are filled in, forming a unit with the steel of the bracket. The smaller piece of rod is brazed into place in the same manner to fill up the space between the first bar and the boss of the bracket as shown on the opposite page.

None of the brackets strengthened by this method have broken in over 6 months of service. It costs Precour about $2.50 to strengthen the two brackets on each Ford engine.

Saving Fuel Costs by Using Kerosene

PRECOUR has also saved on an average of $1.50 per day on the fuel expense of each of his sixteen converted Fords by means of the Dempsey kerosene device shown on the opposite page.

One such device has been fitted on each of the Fords since last October, and Precour attests that the use of kerosene has enabled the vehicles to give the same mileage service on a gallon of kerosene as on a gallon of gasoline with the added advantage of a reduction in cost comparable with 9 cents a gallon for kerosene and 24 to 28 cents for gasoline. The converted Ford vehicles in his service average about 8½ miles to the gallon and cover approximately 40 miles a day.

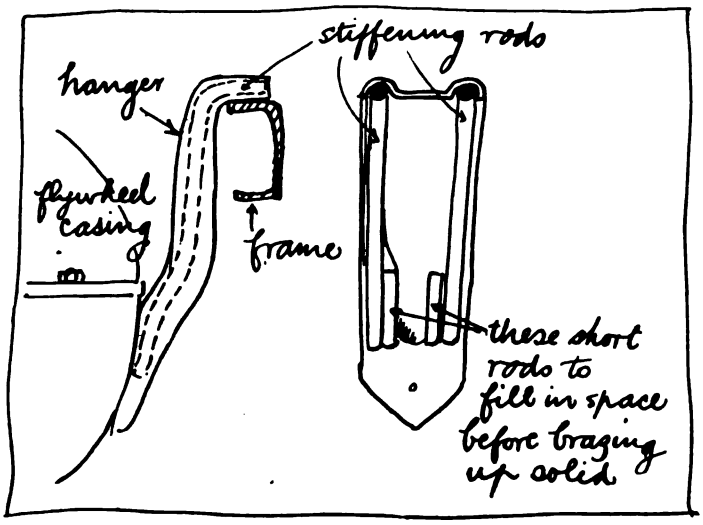
The device costs $50 and consists of two parts, a combined intake and exhaust manifold, which replaces the Ford manifold, and an auxiliary air manifold. The device is furnished with a small gasoline tank mounted on the dash which feeds by gravity to the intake manifold for starting.

The combined manifold is cored as shown in the sketch on the opposite page and has a central tube through which the hot burned gases are exhausted in the usual manner. The regular Ford carbureter is used and feeds the fuel upward and around the exhaust pipe of the manifold into the cylinder, becoming sufficiently heated to form a good explosive gas in the meantime. The auxiliary air manifold which is bolted to the opposite side of the Ford head supplies the extra quantity of air necessary when kerosene instead of gasoline is used and furnishes this air in sufficient amounts to prevent excessive carbon formation. The air fed through this auxiliary manifold is regulated by a throttle working in unison with that of the regular carbureter.

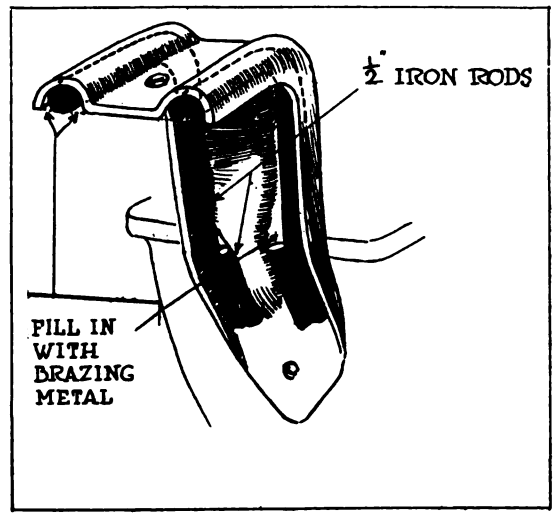
The two manifolds are easily attached, or if desired the maker, The Dempsey Oil Engine Co., Inc., New York City, will furnish a Ford head complete with manifolds if the purchaser will return his Ford cylinder head.

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Stronger Engine Supports on Ford Adapters



Precour's rough pencil sketch



Precour's sketch redrawn

How Precour Strengthens Ford Engine Brackets

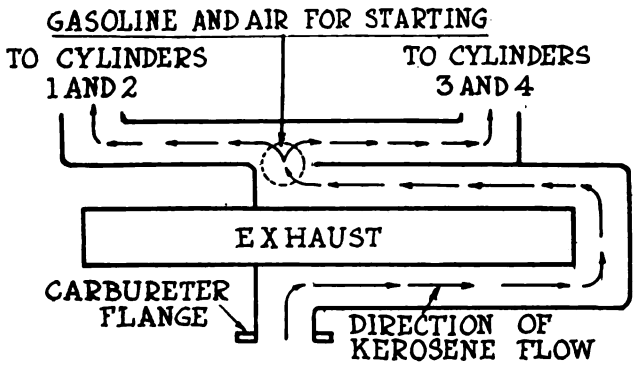
1—Bend ½-in. steel rods as shown.

2—Fit into place as indicated.

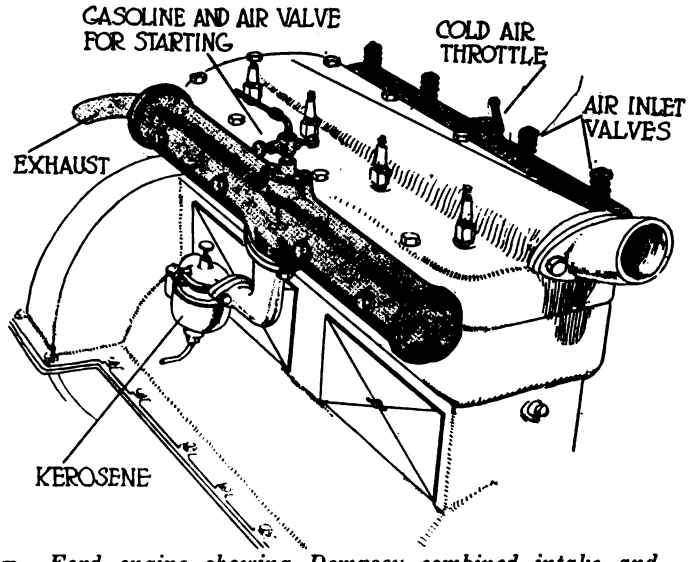
3—Heat with oxy-acetylene torch.

4—Braze into place with brass and flux.

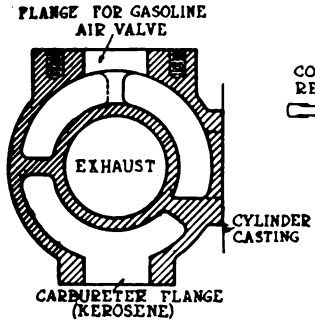
Precour Saves Money Using Kerosene



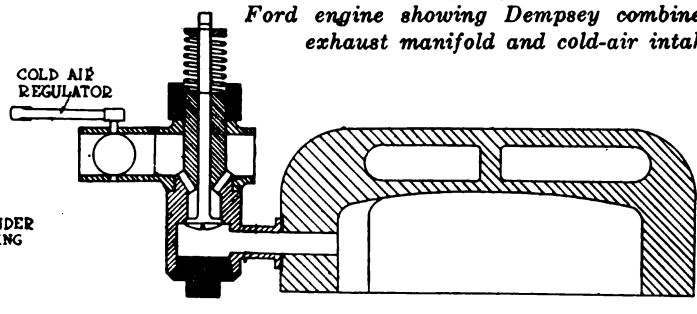
Details of the combined intake and exhaust manifolds, showing path of kerosene from regular Ford carbureter and how heated



Ford engine showing Dempsey combined intake and exhaust manifold and cold-air intake device



Cross - sectional view through intake and exhaust manifold



Sectional view of cold-air intake showing control valve and intake passages

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Trucks as far as the eye can see—French convoys at Chemin-des-Dames

Organization Keynote of Truck Repair Gangs

Efficiency of French War Motors Depends Upon Quick Repairs

By W. F. Bradley

PARIS.—Motor-truck repair gangs are a regular feature of all the armies now working on the Western front. The crews are obtained from the men attached to the traveling workshops which accompany all convoys on active service. These workshops, which are established at some convenient position in the rear of the lines, are entirely truck hauled. Machine tools are mounted on four-wheeled trailers, each tool having its own electric motor and receiving current from the parent machine of the group.

It is not expected that truck drivers shall be capable of making more than simple adjustments. Each convoy has attached to it one or more mechanics specially trained to discover and repair the cause of breakdowns. In cases of extreme urgency, as when an important attack is in progress, orders are sometimes given that no repair work must be done on the roadside. If a truck is stopped and cannot be got going within 5 minutes, it must be pushed off the road and abandoned until there is opportunity for attending to it. This is only done, of course, where available roads are few and any blockage would be detrimental to the interests of the army. In most cases if the driver cannot get going, he drives or pushes his machine as far as possible to the side of the road, and sends in a message to the breakdown gang at the repair station. Military police have instructions never to allow any car to block the traffic. In this respect they are more particular than are the police in the world's capitals.

Some Disabled Trucks Carried Bodily

As far as possible the breakdown gangs get the machine going again under its own power. Frequently, however, this is not possible, and the entire machine has to be carried home. In the French army, breakdown gangs make use of 5-ton trucks, with the driver's seat over the engine and a specially big platform body. This truck is provided with a power-driven winch and a hand-operated capstan at the head of the platform body so that any damaged vehicle can be hauled up an inclined plane to the platform.

Many of the rescue jobs call for much ingenuity on the part of the crew, and are not always carried out without danger when the roads are under fire. The Italians have one type of tractor with an overhead crane capable of lifting 5 tons, which has proved invaluable in difficult rescue work. It can lift a passenger car or ambulance bodily out of a hole or from the foot of an embankment, and place it on solid ground. For this class of work an overhead crane, which can be demountable and need not interfere with the ordinary work of the truck or tractor, is certainly preferable to the more commonly employed winch placed on the rear of the chassis.

Crane Rescues Truck from River

On one occasion a driver of a 2½-ton truck crossing a pontoon bridge over the Isonzo River under fire became scared when a shell burst directly overhead, and drove his truck right off the bridge into the river. It fell on its wheels, with only the top a few inches above water. A tractor with a crane was brought along and hauled the wreck right out of the river. The work had to be carried out as quickly as possible, for the bridge was only wide enough for a single vehicle, and was one of the

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Trucks Are Real Sisters of Mercy to All War Zone Motors





At the top, one of the special repair trucks of the French. Note that it has its engine under the seat to provide an exceptionally large body. A power-driven winch and a hand-operated capstan are furnished

At the left, a British ambulance damaged along the French front. It is being hauled up onto one of the several thousand French repair trucks behind the lines

Below, one of the French motor repairshops brought up to a position just captured from the Germans along the Arras front. Note the small dog tents of the men



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In the recent great aerial activity during the battles of Arras and the Chemin-des-Dames, the large number of Allied airplanes in service placed an extra strenuous task upon the motor trucks attached to the aviation corps. Above, one is shown being taken to the front. Below is shown a convoy halting on the way to the trenches

main approaches to an important position.

Approaching a temporary frontier bridge at a dangerously high speed, an Italian staff car driver running without lights became confused, and shot over the sides into the river 150 feet below. The three officers and driver were killed, and the mechanic washed away. Although the banks were almost perpendicular, the wreckage had been taken away by noon the next day.

Broken Axles Difficult Repair Jobs

The most difficult jobs are heavily loaded trucks with broken stub or rear axles. The writer witnessed a smart piece of work when a loaded 3½-ton truck broke its rear axle. The accident happened at nightfall on a crowded road frequently under fire. As traffic generally thinned down after midnight, the mechanics on the convoy to which this truck was attached decided to carry out the repair themselves. After the load had been transferred to another vehicle, the back of the frame was jacked up and propped up with timber taken from a wrecked house. The wheels were taken off, chain cases removed, for the truck had inclosed chain drive, and finally the axle taken down. For 3 or 4 hours the truck stood on the road with nothing but a few props to support it, while the mechanics were bringing up another axle. This was put into place, and the truck was driven away under its own power by daybreak. All the work had to be done in complete darkness.

Within a few yards of the same spot the writer was the victim of a similar accident. While driving a loaded ambulance in dense traffic and heavy rain one of the differential shafts broke just back of the taper on which the wheel was fitted. It being impossible to carry out any repairs at the time, the wounded men were lifted into the first empty ambulance which happened to pass, and with the aid of friendly soldiers the wrecked car was dragged as far as possible into the muddy ditch at the side of the road. Without mechanical aid it was impossible to get the car right off the road, and as no lights were allowed at this point, it was hoped that no other vehicles would collide with it.

A Temporary Axle Repair

At daybreak a 3-ton truck brought up a Buick axle with double wheels. After considerable labor, the ambulance, an English make, was jacked up and the broken axle removed. While the frame was being carried on props, the Buick axle was put underneath and the wheels replaced. The props were then taken out and axle and frame lashed together with rope. As no brakes were available and the wreck had to be towed 12 miles, a stout prop was lashed between the front axle of the ambulance and the rear cross frame member of the truck in such a way that it would prevent the ambulance running into the truck, yet not interfere with turning movements. In this way the ambulance was towed home safely. Within 3 hours of getting away from the scene of the accident, the house which had supplied most of the timber, and by the side of which the salvage work had been carried out, was hit by an 11-inch shell and razed to the ground.

Few Direct Hits on Trucks

Comparatively few cars are completely destroyed by direct hits from the enemy's guns, though many suffer minor damage. The writer was driving on a road near Gorizia, Austrian territory, when immediately after passing a standing truck loaded with timber the familiar whistle of a shell was heard. From the concussion it was evident that the shell had exploded on the road but a few yards to the rear, but it was not politic to stop and make inquiries. Returning over the same road a quarter of an hour later, it was seen that a 6-inch shell had dropped in the center of the load of timber and completely dispersed it. The body, steering wheel and column, motor hood, etc., were a complete wreck, but the big load of timber had prevented the chassis receiving any real damage. After picking up the tools and spares which were scattered over a radius of 50 yards, the truck was towed home by another vehicle from its own convoy. The driver and mechanic who had gone into a house to ask for labor in unloading the truck escaped without a scratch.

Such luck does not always attend drivers. One of the Fords used by the American Ambulance near Verdun received a direct hit from an

(*Continued on page* 33)

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S. A. E. Proposes Standard Demountable Truck Tire for Army Use

Has Minimum of Parts—Inside and Outside Flanges and Wedges Are Alike—Bolts Inserted at Either Side

A DEMOUNTABLE truck tire equipment with a minimum number of different parts was proposed at the first meeting of the Society of Automotive Engineers since the society officially changed its name and broadened its scope to include aeronautic, tractor and marine engineering. The meeting was held in Cleveland, Ohio, on May 3. The new tire equipment, which was the most important subject discussed insofar as motor trucks are concerned, is the result of an attempt to provide a simple equipment to meet the requirements of the U. S. Army truck specifications as published in full in the last issue of THE COMMERCIAL VEHICLE.

In brief, the inside and outside flanges are the same, all the wedges are identical and the bolts can be put in either way around.

The effect such an equipment will have upon the fittings used on trucks in commercial service is problematical, since the large majority of solid tires are of the pressed-on type and probably will continue to be so, due to the growing popularity of the metal wheel which holds its shape much better than the wooden type. Presses for fitting pressed-on tires are conveniently located in most of the larger cities. They are much scarcer in army repair shops and are not easily moved about from place to place as the lines of an army change, hence the desire for a demountable solid tire equipment which will enable tires to be changed at the roadside.

One of the hardest worked divisions of the last year has been that of the truck standards, although the results do not appear conspicuously in report form. Practically the whole of their attention has been given to assisting the War Department in preparing the recently issued standard specifications for military trucks, in which work they have been assisted by the electrical equipment division and the springs division. Certain points in connection with the specifications are still under discussion, and the recently created transmission division of the standards committee spent a good many hours May 2 and 3 discussing the best methods for meeting the specification requirements with respect to gear ratio. There was no formal report presented from the truck standards division, but K. W. Zimmerschied made a motion to the effect that the standards committee as a whole ratified and supported the work done by the truck standards and other divisions in connection with the military specifications, the motion being accepted unanimously. On a second motion, also proposed by Mr. Zimmerschied, the committee sent a telegram to H. D. Church, chairman of the truck standards division, who was prevented from attending by very serious illness, congratulating him on the work done and expressing their sincerest sympathy and hopes for his speedy recovery.

Designation of Military Truck

In discussing the military specifications it was suggested that the terminology be changed by the War Department and that the trucks be called light and heavy instead of 1½ and 3 ton. It was pointed out that the capacities called for are considerably in excess of the nominal capacities, which makes a military truck essentially a heavier job than a commercial truck of the actual capacities of 1½ and 3 tons. Mr. Britton, speaking from his viewpoint as representing the department, said that the point was well taken and the idea a good one. A resolution is now being drafted by the Society management for submission to the Department, drawing attention to commercial advantages which would accrue if the naming of the trucks was changed.

The subject of solid tire and demountable rim equipment for military trucks was discussed at length and Mr. Britton made it clear that the Quartermaster General's office is very desirous of arriving at a standard by co-operative means. As a result of the discussion, the entire Tire and Rim Division concurred in the following resolution:

WHEREAS, assuming that the Government considers the demountable solid tire as a military necessity; therefore,

BE IT RESOLVED that the Tire and Rim Division of the Standards Committee of the Society of Automotive Engineers recommend that the standard specifications for the demountable tire and rim equipment and fastenings for the 1½ and 3-ton military trucks shall be as follows:

1—Felloe bands and nominal tire diameters are to conform to S. A. E. standard specifications.

2—A type of tire channel shall be used which will permit of one size of wedge ring being used for both single and dual equipment, regardless of sectional size; also one standard section of center wedge ring for use between dual tires of all sectional sizes.

3—Side flanges shall be used, having the S. A. E. standard bolt circles. Flanges shall be provided with bolt holes in accordance with S. A. E. standards;

36 in.—12 holes,
40 in.—15 holes.

These flanges shall be provided with bolt holes 9/16 in. square, with spherical counter-boring which will permit these flanges to be used for either inside or outside flanges. See Figs. A and A-1, hereto attached.

4—Side wedge rings shall be as per the illustration on page 22, or equivalent.

5—Center wedge rings shall be as per shown, or equivalent.

6—Ends of all side wedge rings shall be cut as shown, or equivalent.

7—All nuts shall be as indicated, or equivalent, preferably case-hardened.

8—Bolt heads shall be made to conform to the square hole and the spherical counter-boring in the side flange, and the lengths shall be according to the following table:

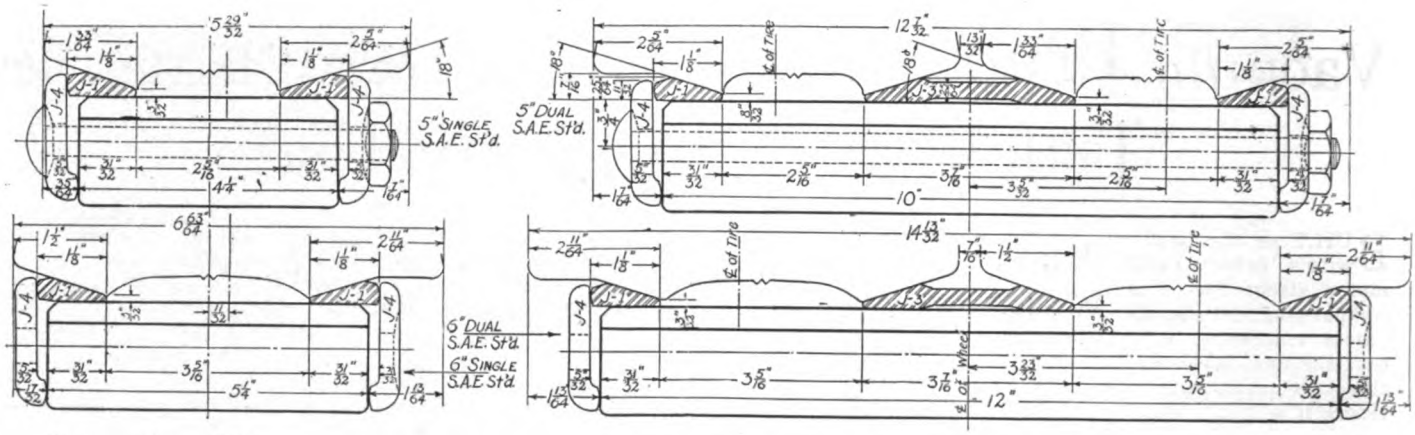
BOLT LENGTHS

Tire Section	Single	Dual
4	4⅝	9½
5	5⅝	11½
6	6⅝	13½
7	7⅝	15½

All bolts ½ x 13 U. S. F. Threaded 1¼ in. minimum.

9—Contours of the under side of tire channels shall be equal to or interchangeable with the contours shown.

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Cross sections of the new proposed demountable solid tire equipment for U. S. Army trucks. Note that all the wedges are identical, the inside and outside flanges the same, and that the bolts can be put in either way around

10—It is understood that the present tire sizes in the military truck specifications are:

36 by 4-in. single,	36 by 7-in. single,
36 by 5-in. single,	36 by 5-in. dual,
36 by 6-in. single,	36 by 6-in. dual.

The tests of the tire and rim makers on types and dimensions of pneumatic tire rims have not been completed and the subject was tabled for the next meeting.

The tests of the tire and rim makers on the thickness of pneumatic tire rims have not been completed and the subject was tabled for the next meeting.

In reference to the carrying-capacity and inflation-pressure of pneumatic tires a letter presented before the division, written by C. C. Carlton, as chairman of the executive committee of the C. A. T. M. A., to K. W. Zimmerschied, chairman of the tire and rim division, was read. This letter is the report of the final conclusions of the C. A. T. M. A. on carrying-capacity and inflation-pressure of pneumatic tires.

Upon motion duly seconded, put and carried the table presented by Mr. Carlton was adopted as the proposed standard of the S. A. E. and is as follows, the loads per tire and the pounds per square inch inflation being maximums:

3-in.—	375 lb. per tire,	45 lb. inflation
3½-in.—	570 lb. per tire,	55 lb. inflation
4-in.—	815 lb. per tire,	65 lb. inflation
4½-in.—	1,100 lb. per tire,	75 lb. inflation
5-in.—	1,300 lb. per tire,	80 lb. inflation
5½-in.—	1,700 lb. per tire,	85 lb. inflation
6-in.—	2,000 lb. per tire	90 lb. inflation

The members of the division were not ready to take a final vote on pneumatic tires for motor trucks, as the data were incomplete.

In view of the previous action of the division, which was not approved by the Society as a whole, it was decided to table the matter of carrying-capacities for solid tires for the present.

Our London Letter

By R. Douglas-Vickers

LONDON, ENG., March 9—British motor truck manufacturers have been interesting themselves in the farm tractor question with a view to taking up this branch of automobile engineering as a standby in case there is a slump in truck sales. I have discussed the matter with many of them and gather that they would very much like to embark on tractor production if they could feel certain as to what British farming requirements really are. The whole movement is so much of a novelty and there is so little data to draw upon, at all events as far as this country is concerned, that there is a good deal of hesitation. Few of them seem disposed to make the plunge at the moment, but the matter is ripening very rapidly.

For the last 25 years or so the land in this country has been gradually going out of cultivation, largely through economic causes. The large importations of cheap grain from the American continent, that is to say from the United States, Canada and Argentina, from Russia and Rumania, as well as Australia, have not made it worth the British farmer's while to grow cereals except for his own consumption. It was much more profitable to raise stock like sheep and oxen, especially as this involved less labor. The result was that wherever one went about the country, certainly this is very true of England, nothing but extensive tracts of grazing lands were to be seen.

American Machines Predominate

As your readers are aware, the changed economic conditions brought about by the war have made it an absolute necessity that we should at once break up as much of these grass lands as possible, so as to be less dependent for our food supplies on foreign sources. Motor-driven machinery, nearly all of it from United States firms, is being obtained to assist the farmers in this immense undertaking, and by way of practical encouragement the government has just guaranteed to them a minimum price for their wheat for the next 5 years. They now know where they are, so to speak, and this guarantee secures to them a very good return, even allowing for very enhanced costs.

As several million acres are to be broken up for tillage this will mean, coupled with the fact of the 5 years' guarantee, that there will be a big market here for agricultural tractors for the period indicated. I cannot tell you at the time of writing how British engineering firms, particularly the commercial vehicle builders, will respond to this opportunity. I am informed on credible authority that the Ministry of Munitions has authorized Mr. S. F. Edge, who is head of the farm tractor branch, to convene a conference of the leading British motor firms to discuss and formulate a scheme for the production of farm motor tractors on a large scale. If they decide to take the matter up either individually or collectively, I believe that they will have every facility accorded them.

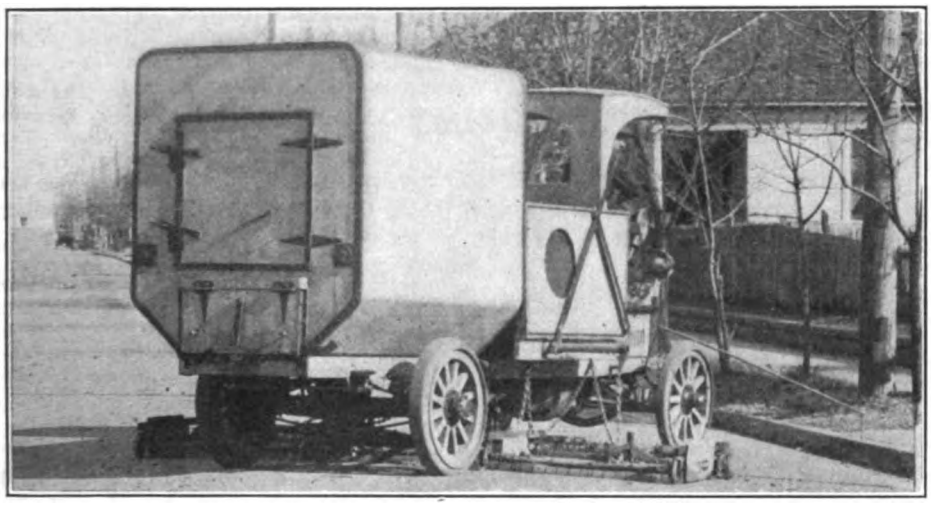
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Vacuum Street Sweeper Washes Air Exhausted

All Dust Removed by Passing Air Through Water Seal

BUILT on the principle of the housewife's carpet sweeper, the Baxter motor street cleaner shown in the accompanying illustrations differs from others employing a vacuum system in that the dust-laden air sucked up off the street is passed through a water seal before it is finally exhausted into the atmosphere from the dirt storage bin. That particular method is used for sanitary reasons so that the small particles of dust which are not precipitated in the bins in the usual way are not exhausted into the air to be later inhaled by pedestrians on the streets where the sweeping operations are being carried on.

The outfit, known as the California vacuum street cleaner, is made by W. E. Baxter, Los Angeles, Cal. It consists of a specially constructed Moreland distillate-burning motor truck chassis with its engine under the seats, made by the Moreland Motor Truck Co., of the same city, on which is mounted the sweeping mechanism. This consists of a separate engine and blower which sucks the dust up off the street through a suction head and deposits it in a two-part bin carried on the truck chassis in the place of the conventional body.



Rear view of the California vacuum street sweeper showing rear doors in two-compartment bin; the circular opening in casing over engine and blower directly in front of bin through which the exhaust escapes to the atmosphere and the one-man control of the header-elevating mechanism

Separate Blower Motor

The separate engine and blower is a direct-connected unit which is mounted crosswise of the truck frame directly aft the driver's seat. The engine is of the four-cylinder gasoline type and develops approximately 18 hp. It and the blower are mounted on a common base for rigidity.

The engine is controlled from the driver's seat and is operated independently of the truck itself. This enables the speed of the blower engine to be regulated to best suit the conditions on the streets being cleaned and irrespective of the speed of the vehicle. If driven off the truck gearset or some member of the propelling mechanism, the blower engine speed and that of the truck would be interdependent and it might be that certain street conditions would demand a combination of vehicle and blower engine speeds that could not be obtained.

Operated by One Man

The blower serves to suck up the dust off the street through a funnel-shaped metal casing terminating in a rectangular header at the bottom. This header extends out beyond the width of the truck on either side and is supported by means of horizontal arms on the truck frame and interconnecting chains. By a system of levers, the entire header may be lifted clear off the street when the vehicle is in motion but not actually engaged in sweeping. This same system of levers, which is controlled from the driver's seat, is also used to keep the header at the proper distance from the street surface according to the class of pavement being cleaned.

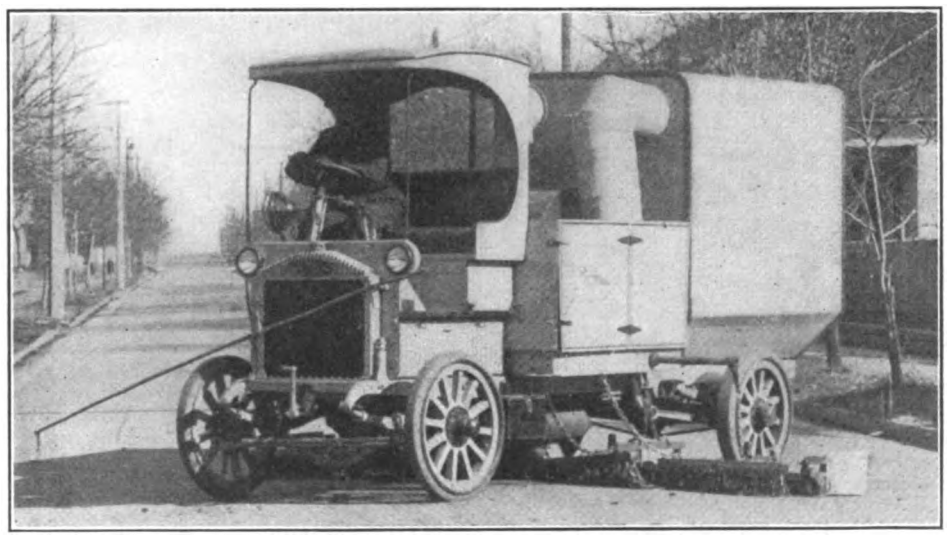
Contact of the header with the street is made by means of two weighted curtains, one at the front and the other at the rear of the header. These form a sort of trough between the front and rear of the header from which the dust is picked up as the vehicle moves along. The curtains thus serve to restrict the area from which the air suction picks up the dirt in order to prevent taking in nothing but air at points a few inches above the street surface. The dust is drawn into the suction head through a 5⅛ in. opening which extends the whole length of the head at the rear side.

From there it is drawn up through the funnel-shaped metal casing to the center of the blower, from which it is expelled into the top of the two-part bin through a cylindrical pipe as shown in the accompanying illustration.

Two-Compartment Bin Employed

The bin in which the dirt is deposited is roughly rectangular except for a flare inward on either side at the bottom where it is mounted directly on the chassis frame as shown in the accompanying illustrations. The bin is divided into two parts by a horizontal partition about three-quarters of the depth down from the top. The lower section is provided with an inverted box about 20 in. wide and 7 ft. 6 in. long. This extends to within about 4 in. of the bottom. A

(*Continued on page* 25)

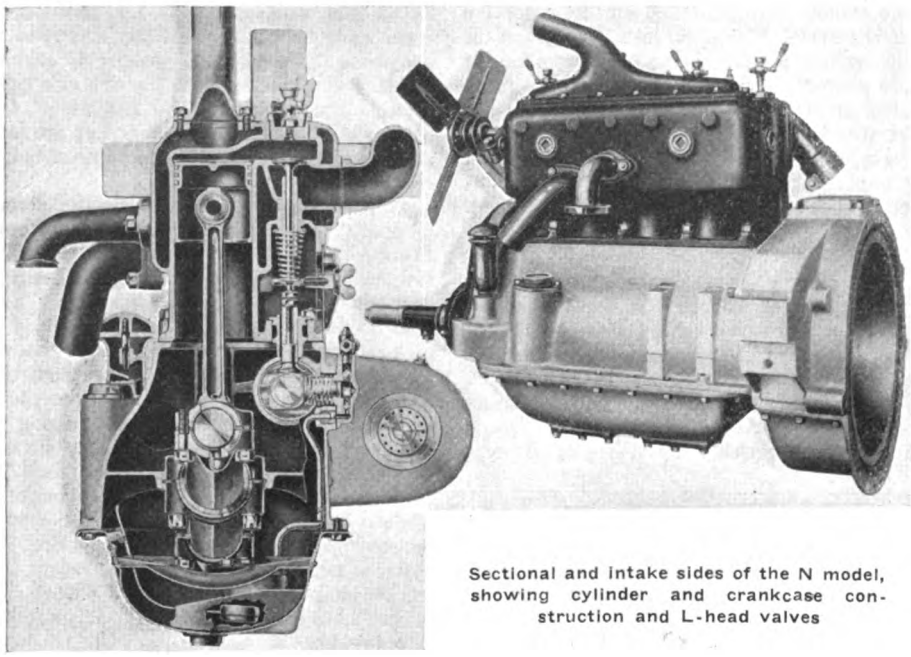


The sweeper as seen from the front, showing the suction header, the intake pipe from the blower to the top of the bin and the transverse rod in front of the radiator to show the clearance necessary for the outrigged header

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Continental Truck Engines in Five Sizes

Three Standardized Types, All of the Four-cylinder, L-head Design from 3½ by 5 to 4½ by 5½



Sectional and intake sides of the N model, showing cylinder and crankcase construction and L-head valves

FIVE standardized sizes made in but three types constitute the present Continental engines for trucks. Besides these there are some sixes which are sometimes used in trucks, but these are not considered truck engines; all of the truck engines are of the four-cylinder type, L-headed and, save only the largest, all block cast. The largest four is pair-cast, but otherwise resembles the smaller models.

The smallest truck engine is by no means the smallest built by the Continental Motors Corp., for a smaller size is built for light cars and small delivery vehicles. The three truck types are characteristically as follows:

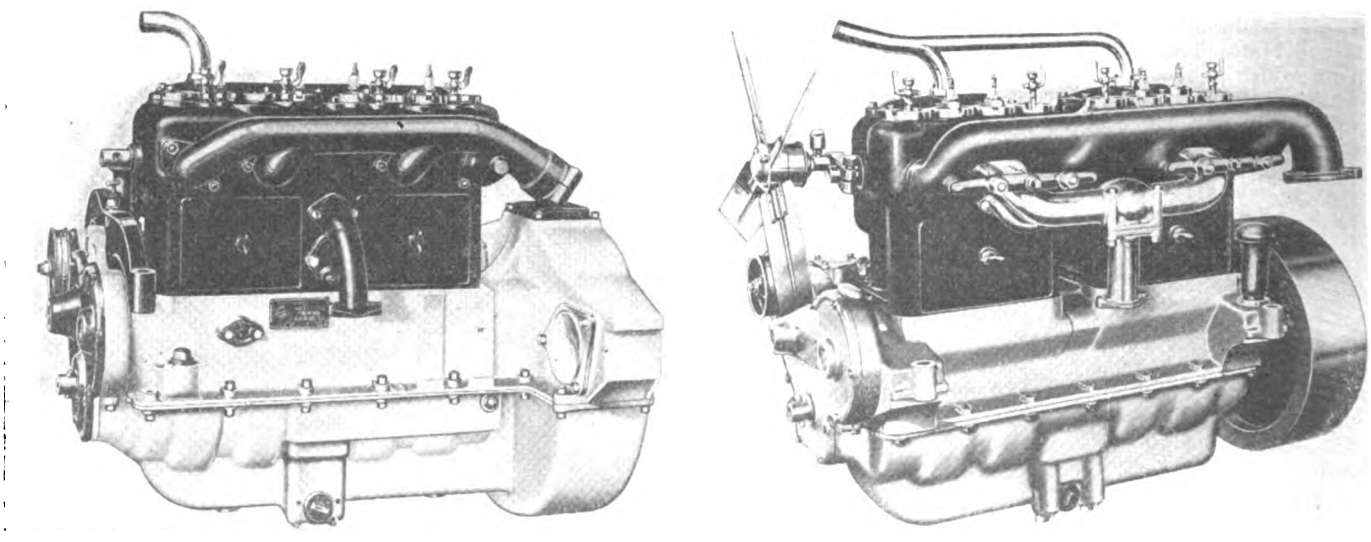
Model	Bore	Stroke	N. A. C. C. horsepower	Cu. in. piston displacement
N	3½	5	19.61	192.42
N	3¾	5	22.50	215.98
C 4	3¾	5¼	22.50	226.78
C 4	4⅛	5¼	27.20	290.64
E	4½	5½	32.40	349.89

All Continentals for commercial vehicles are made either in the independent or unit powerplant style, the former having four support arms, cast integral with the upper crankcase-half for mounting on a subframe, and the latter a three-point support comprising rigid flywheel bell-housing arms and a forged beam in front for mounting direct on the mainframe.

Model N differs from the other two in that its valves are to the right of the engine instead of to the left, with the inlet manifold cored out in the cylinder block so that the carbureter bolts to the non-valve or left side. This construction affords many advantages. The gas is made to pass between the two middle cylinders and is so surrounded by hot metal surfaces that condensation is unlikely. The carbureter and intake pipe, being on the right, are out of the way of the valve-spring inclosure plates, but at the same time convenient to the conventional left-side placing of the steering gear for the control connection. On this model the magneto drive is at the right and provision is made for a two-unit electric lighting and starting system. It also differs in that it is built for thermo-syphon water circulation.

The two C 4 engines are perhaps the most popular Continentals for truck use, being intended for medium capacities. They have their valves to the left. Like the smaller type, in this the intake manifold is contained in the cylinder block, but unlike it, the carbureter connection is on the valve side so that the gas does not pass between the cylinders. The pump and magneto are both driven from the same shaft on the right side of this model. Provision is made for a two-unit electric system.

The big engine has an exterior manifold, on the left or valve side, of course, but with the alley between the cylinders it is possible to place the carbureter on the right side, extending a pipe through



The model E Continental, 4½ by 5½, with a S. A. E. horsepower of 32.40, is shown at the right. Note that the cylinders are cast in pairs. Note also the intake and exhaust manifold construction. At the left is a model C arranged for a unit powerplant assembly

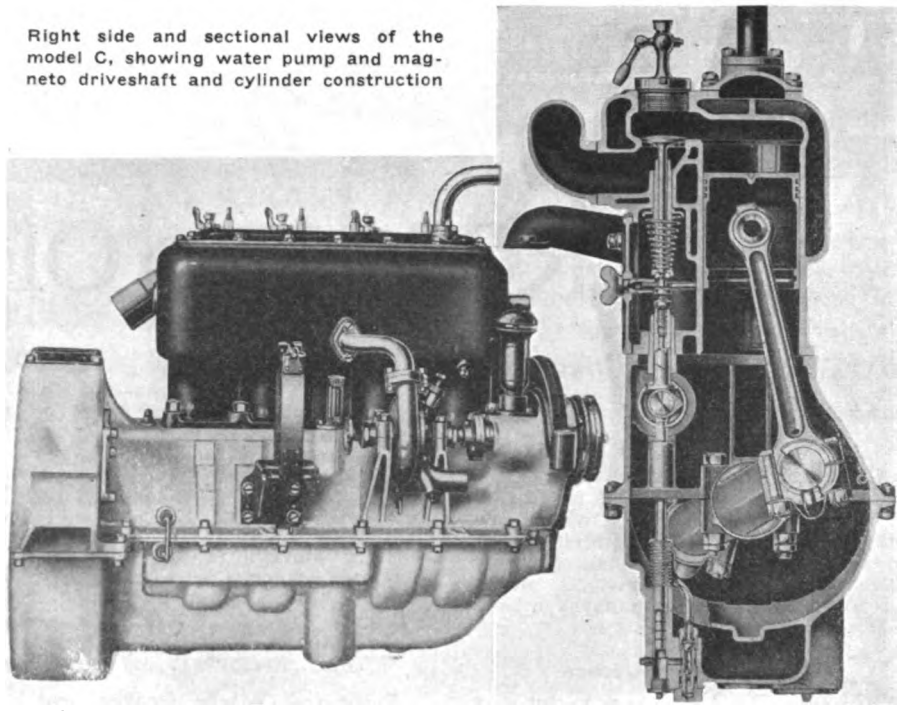
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to the left side. It, too, has a single right-side drive for both pump and magneto, and takes standard types of two-unit electric starting and lighting systems.

On all Continental truck engines the timing gears are helically cut to reduce noise. All of them also have splash-pressure lubrication, that is, the oil is positively circulated by a pump and fed to some points under pressure, the surplus from such feeds draining into the crankcase, where it collects in splash troughs to be picked up and splashed over the pistons, wristpins, camshaft and tappets. The connecting rods have dippers on their ends to pick up the oil, feeding it to the crankpins.

On all models alike the pressure feed is from the pump through copper tubes to the rear main bearing and over the timing gears. In Model N the pump is of the horizontal plunger type, located in the side of the crankcase. In the others a double plunger type, placed vertically and located in the bottom half of the crankcase, is employed.

Finishing on the flywheel bell-housing is done in accordance with the type of clutch and gearset employed.



Right side and sectional views of the model C, showing water pump and magneto driveshaft and cylinder construction

Vacuum Street Sweeper Washes Exhaust Air

(*Continued from page* 23)

sufficient amount of water is carried in the bottom of the lower bin to submerge the lower edges of the inverted box to a depth of 1 in. and thus form a water seal of that depth.

In operation, the dust-laden air is thrown out from the periphery of the blower into a large pipe which rises vertically and then extends backward horizontally by the use of a pipe elbow into the top of the upper bin. Here it swirls around and deposits all except about 3 per cent of the dust by gravity and the sudden expansion of volume in the box as compared with that of the pipe. The dust accumulates on the partition between the two sections of the bin and is removed by shovels through a large hinged door at the rear as shown in one of the accompanying pictures.



To run on a motor car schedule is the aim of this Moreland truck with a prairie schooner top. The picture shows the vehicle on its way from San Francisco, Cal., to St. Louis, Mo. It is aiming to keep pace with the pleasure car caravan of the San Francisco Ad Club on their way to their 1917 convention. According to latest reports as this paper goes to press the schooner is keeping up with the less heavy units of the procession

How Dust Is Precipitated

As the dust-laden air continues to be forced into the upper bin, that air from which the dirt has been precipitated is carried out and down through a second pipe near the top of the bin into the inverted box in the lower section where it is forced to pass through the water seal before entering the lower bin proper. From there it is exhausted into the atmosphere through another pipe which terminates in the side of the metal covering which encloses the engine and blower mechanism. The bin has a capacity of about 2½ cubic yards of sweepings.

The California outfit was first tried out in Los Angeles, Cal., for a period of 10 months, at the conclusion of which time the city authorities entered into a contract for 3 years to clean its streets by such equipment. The rated capacity of the cleaner is about 200,000 square yards of pavement in 8 hours. It is operated by one man. Due to the use of distillate fuel instead of gasoline, one of the outstanding characteristics of the Moreland engine, the fuel cost is said to be about $1.25 a day, including oil and grease.

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The Readers' Forum

Devoted to topics pertinent to commercial vehicle operation design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

DATA ON 175-TRUCK GARAGE

Reader Wants Advice on Probable Cost and Income

To the Editor, COMMERCIAL VEHICLE:

I contemplate establishing a truck garage business in a large city within 100 miles of Boston. Will you kindly check the statements of the estimated yearly income and expenditure given herewith and advise of any discrepancy you may find?

Proposed Truck Garage

The proposed building is to be 100 feet frontage and 60 feet deep, six floors and basement. Total capacity to be about 200 trucks. While commercial vehicles are out in the daytime, the space is to be used for day storage of passenger cars.

Estimated Yearly Receipts

1—Rent 175 regular night boarders 12 months, average $20 each per mo. (This charge is low; average will likely be $25, which is entirely commensurate with first-class service)	$42,000
2—Day storage; fifty day boarders at 50 cents each for 300 days. (The charge of 50 cents per day is quite low; 75 cents even is very reasonable, and at such figure the capacity of the garage ought to be taxed to the utmost; 50 cars per day is figuring safely)	7,500
3—Gasoline, 262,500 gal. per year at 2 cents net per gal. (175 trucks 5 gal. each per day, 300 days; all big garages make a profit of about 4 cents per gal. on gasoline)	5,250
4—Oil and grease, 26,250 gal. per year at 20 cents net, figured at ½ gal. per day per truck for all kinds of lubricants. (All big garages make 25 to 30 cents per gal. on lubricant)	5,250
5—Washing of cars left for day. (Ten cars washed per day should be the minimum; net profit would be about $7.50 per day; no deduction for this item has been made in the labor expenditure noted below)	Not counted
6—Miscellaneous sales. (Alcohol, accessories, tires should net a fair profit; all garages count on this item)	Not counted
7—Night storage of transients. (Could charge $1 to $1.50; this would amount to something.)	Not counted
TOTAL RECEIPTS	$60,000

Assuming all the above to be facts, are the conclusions and statements given below reasonable and conservative? If not, what is wrong?

Estimated Yearly Expenditures

1—Taxes	$3,000
2—Light and power; two freight and one passenger elevators.	3,000
3—Heat	1,250
4—Water	300
5—Telephone	48
6—Shop; sponges, chamois, soap, towels, etc.	1,000
7—Office supplies and stationery	300
8—Incidentals and sundries	1,000
9—Insurance	1,819
10—Depreciation of building	900
11—Interest	9,550
12—Labor	21,320
(Comprises day force—1 foreman at $25 per week, 1 doorman at $20 per week, 3 office men at $20 each per week, 1 elevator man at $20 per week, 5 floormen or washers at $20 each per week. Night force—1 foreman at $25 per week, 1 office man at $20 per week, 7 floormen or washers at $20 each per week.)	
TOTAL EXPENDITURE	$43,487

Any other advice which you may furnish will be appreciated.

If you make a charge for such service I shall be pleased to pay it.—A. V. S., Belmont, Mass.

The conclusions and statements as arrived at in the calculations for the proposed motor truck garage, as given above, appear to be correct, with the following exceptions:

1—You evidently have not made any provision for charges which must be spent for getting accounts. A truck garage in which 175 commercial vehicles are maintained is a very large garage and considerable pioneering work would be necessary to get the owners of such a large number of trucks to maintain them in your station. These charges would be large during the first year of the operation of your garage and a lesser sum would have to be spent each year to keep the number of cars up to somewhere near the capacity. Considering your figures of total expenditure as approximately $43,000 and total receipts of $60,000 it would seem that the garage must be kept approximately two-thirds full at all times to enable you to break even on the investment. This means that you will lose money as soon as the number of trucks garaged drops below 116, provided the receipts for washing and miscellaneous sales of accessories, etc., and night storage of transients do not make up the discrepancy.

2—If the garage were to maintain 175 trucks year in and year out, it would be necessary for you to install some sort of a service station at which owners could secure parts for their vehicles and perhaps have minor repair work done. The installation of such a station would add to your original outlay, although it is highly probable that the operation of such a station would be profitable and add considerably to the income.

This information and any other regarding the operation of motor trucks in any line of business whatever is furnished gratis.

HOW TO PROMOTE TRUCK SALES

Reader Wants Statistics in Territory of Syracuse and Central New York

To the Editor, COMMERCIAL VEHICLE:

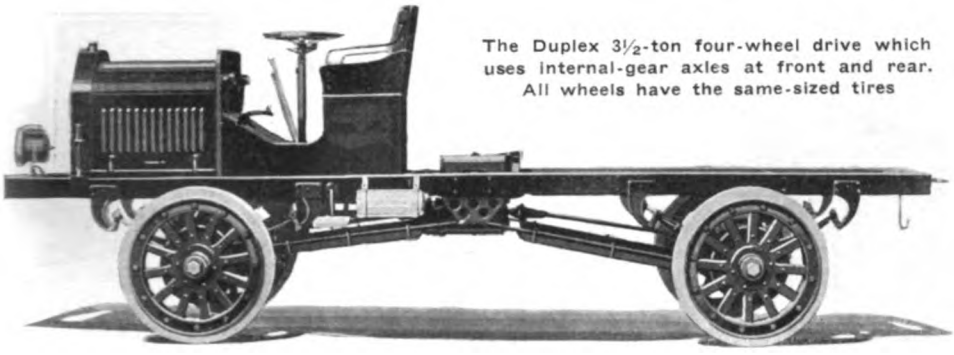
Will you please give us statistics to promote the sales of motor trucks in our territory? We would also appreciate any statistics you may be able to furnish in regard to the industry and commercial wealth in the territory including Syracuse, central New York and the northern and southern boundary counties.—A. E. D., H. Barcroft White Corp., Syracuse, N. Y.

The most recent article appearing in THE COMMERCIAL VEHICLE regarding conditions in your territory was published on pages 5 to 7 in the November 15, 1916, issue.

That article treated of Rochester, Buffalo and Syracuse as motor trucking centers and pointed out the reasons for the rapid advance of motorized transportation in those centers.

Aside from that article, we believe one of the best ways to promote sales in your territory would be by reading each issue of THE COMMERCIAL VEHICLE, in which there are always several stories telling how business concerns have re-

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The Duplex 3½-ton four-wheel drive which uses internal-gear axles at front and rear. All wheels have the same-sized tires

Duplex Four-wheel-driven Truck in One Model of 3½ Tons

DUPLEX four-wheel driven trucks are offered in one model of 3½-tons capacity by the Duplex Truck Co. of Lansing, Mich. They are partly assembled and partly manufactured trucks and in brief take their power from unit powerplants to special chain cases mounted amidships and thence by driveshafts which extend forward and aft to internal-gear-driven front and rear axles.

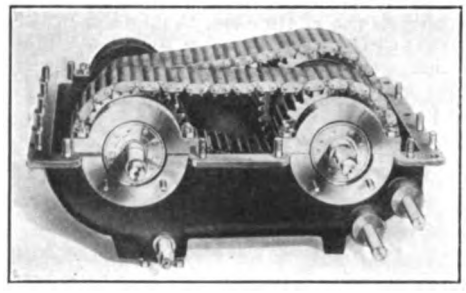
The engine is a Buda mounted off the centerline of the truck under a conventional hood. The motor is not symmetrically placed because of the driveshaft to the front axle. The engine cylinders are 4½ by 5½ and are cast in block. Pistons are of cast iron with leak-proof rings. Valves are on the right. The engine is in a unit powerplant assembly with a Borg & Beck dry-disk clutch and a Cotta three-speed gearset of the constant-mesh, individual-clutch type.

The engine is cooled by a centrifugal pump used in conjunction with a vertical finned-tube radiator with a pressed steel casing.

A Stewart vacuum feed is employed to carry the fuel from a 25-gal. tank under the driver's seat to the Schebler carbureter on the left side of the engine. Ignition is on the single plan, employing an Eisemann high-tension magneto with hand-controlled spark advance. Any standard make of electric starter may be fitted on the engine, although the Duplex company only offers a single-unit lighting system of 6 volts as extra equipment at option, but at extra cost.

DUPLEX SPECIFICATIONS

Capacity, lbs.	7,000
Price	$3,600
Wheelbase, in.	130
Tires, front	36x6
Tires, rear	36x6
Bore, in.	4¼
Stroke, in.	5½
N. A. C. C. hp.	29.00
Gear-ratio in high gear	8 or 16-1
Final drive	int.-gear

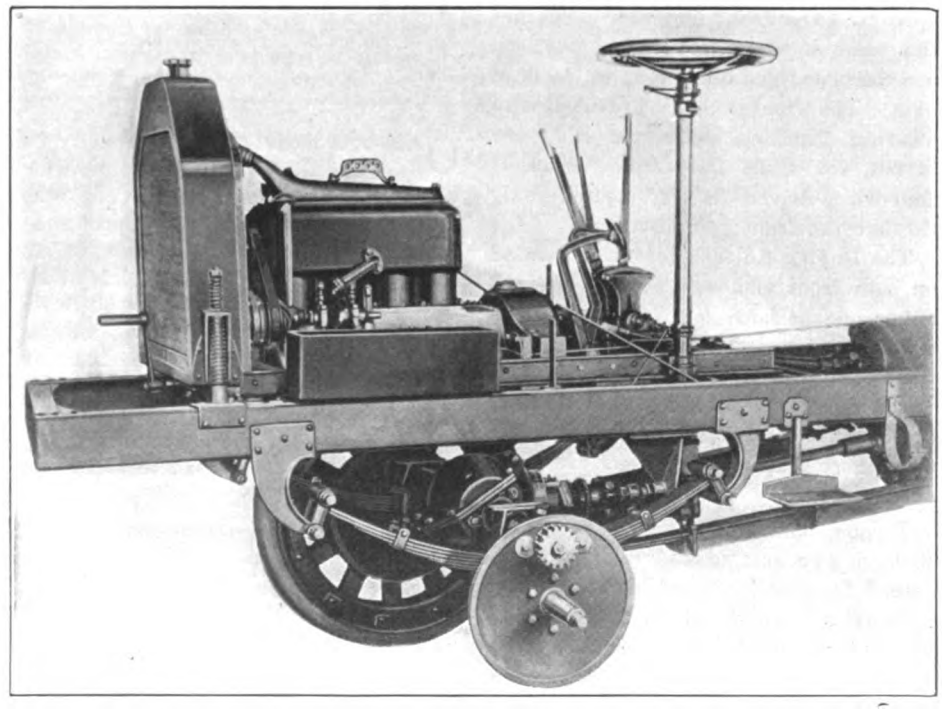


The Duplex chain case which permits the final gear ratio to be doubled in any speed

From the engine the power is transmitted through the clutch and gearset of the types and makes mentioned above and thence by a short shaft with two universals to the chain case mounted amidships. This chain case serves as a means for dividing the power so that equal amounts are transmitted to both front and rear axles and also as a means for increasing the final gear ratio between the motor and the driving wheels when especially arduous country must be negotiated. As shown in one of the accompanying illustrations, the chain case consists of an outside container in which are mounted two parallel shafts with two sets of gears on each. The driveshaft from the engine is joined to one of the gear shafts and the power is transferred from the latter to the other gearshaft, to which are joined the front end of the rear axle propeller shaft and the rear end of the front propeller shaft by means of a silent chain. This method serves to transmit the power to the front wheels under ordinary conditions.

The second set of gears in the chain case is also joined by a silent chain. This unit is inoperative except when very difficult road conditions are met with, at which time it may be thrown into mesh to give a 16 to 1 instead of an 8 to 1 final gear reduction in direct gear. This practically doubles the power supplied to the wheels and enables the vehicle to travel up the grade from a gravel pit or over a railroad embankment with comparative ease.

The second set of gears and silent chain is manipulated from the driver's

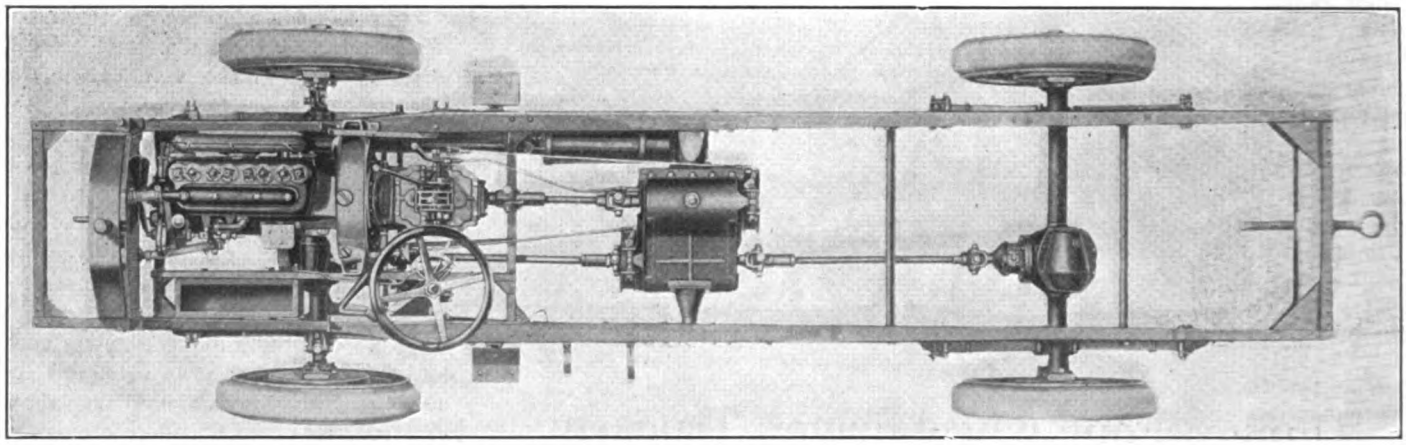


The front end of the Duplex four-wheel-driven truck, showing motor, control units, front axle, spring suspension and small internal-gear driving pinion

Wanted Ideas on Good Truck Repairs

See pages 16 and 17

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Chassis view of the Duplex 3½-tonner, showing engine off center line; unit powerplant and chain case

seat and may be thrown into mesh with the same ease as changing gears. It must be remembered that the reduction is doubled as soon as the second set of gears is thrown into mesh, no matter what one of the three forward speeds or one reverse of the regular gearset happens to be thrown in. In this way the final gear reduction in low may be either 32 or 64 to 1 or 33 or 66 to 1 in reverse. As shown in the plan chassis view at the top of this page, two universals are used on each one of the propeller shafts between the chain case and the axle.

The propeller shafts deliver the power to similar internal-gear-driven axles at front and rear. The axle jack shaft is mounted directly above the dead shaft of the axle which carries the load, this giving good ground clearance. It extends through a special bracket on top of the springs and is held in place by the spring pad bolts that join the dead axle to the springs. The front and rear axles are the same insofar as the live portions are concerned and differ only in the dead axle. The front axle is provided with steering knuckles, while the rear one is not, for while the Duplex truck is four-wheel-driven it is steered only through the front pair of wheels.

The Duplex Adler differential is fitted on both front and rear axles to prevent either one or both sets of wheels from spinning when it has lost traction. By the use of this differential, which is of the self-locking type, it is possible for the truck to extricate itself from a position where three of its wheels are without traction.

Torque and propulsion are taken through two sets of radius rods which extend from each side of both front and rear axles to special fittings attached to the under side of the chassis frame opposite the chain case supports. The springs have shackles at both ends. Both sets are of the semi-elliptic type, 43 in. long.

Your Best Truck Repairs
See pages 16 and 17

None of the brakes are on the wheels. The foot brake is of the contracting type and operates on the rear end of the main propeller shaft, which is extended through the chain case. The hand brake, also of the contracting type, acts on the front and rear propeller shafts and is located just forward of the chain case.

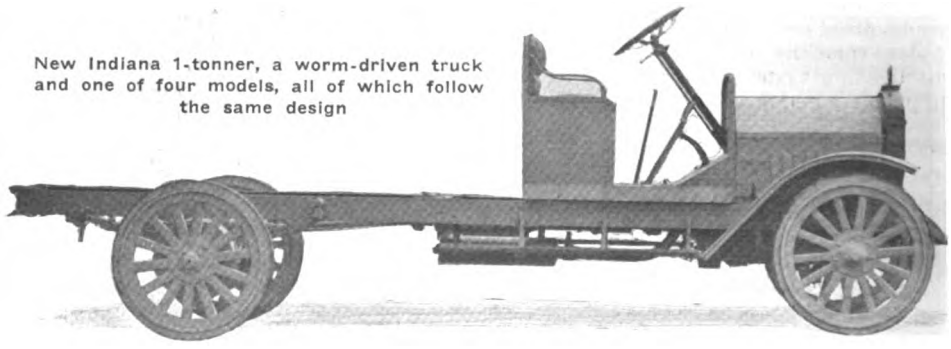
The frame, of pressed steel and made in the semi-flexible type, is held at the corners by gusset plates. A spring drawbar for trailers is standard equipment on Duplex trucks. All four wheels are alike and fitted with the same-sized tires. Left steer and center control are employed, Lavine steering gear being used.

Indiana Adds 1-ton Model to Line—Four Sizes Now Offered

INDIANA SPECIFICATIONS

Capacity, lbs.	2,000	4,000	7,000	10,000
Price	..	$2,100	$2,750	$3,600
Wheelbase, inches	135	150	156	163
Tires, front	34x3½	36x4	36x5	36x5
Tires, rear	34x4	36x7	36x5d	36x6d
Bore, inches	3½	4½	4¾	5 1/16
Stroke, inches	5¼	5½	5¾	5½
N. A. C. C. horsepower	19.61	27.20	29.00	41.62
Speed, r.p.m.	1,400	1,100	1,160	1,080
Speed, m.p.h.	20	15	12	11
Gear-ratio in high gear	7.00-1	7.75-1	10 33-1	11.75-1
Final drive	Worm	Worm	Worm	Worm

ONE new model of 1-ton capacity has been added to the Indiana line, which now consists of four units. The other sizes are a 2-tonner, a 3½-tonner and a 5-ton model. The line, made by the Indiana Truck Corp., Marion, Ind., and until 1916 known as the Harwood-Barley company, making the Harwood-Barley truck, is assembled mostly from standard parts made by specialists. All four models follow the same general design with cast-case, vertical finned-tube radiators, except the 5-tonner, which has cellular core, motors under bonnets, dry-plate clutches, three-speed selective gearsets mounted amidships and final worm drive, with the torque taken through the springs in each case and the propulsion



New Indiana 1-tonner, a worm-driven truck and one of four models, all of which follow the same design

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through radius rods in all except the 1-tonner, in which it is taken through the springs.

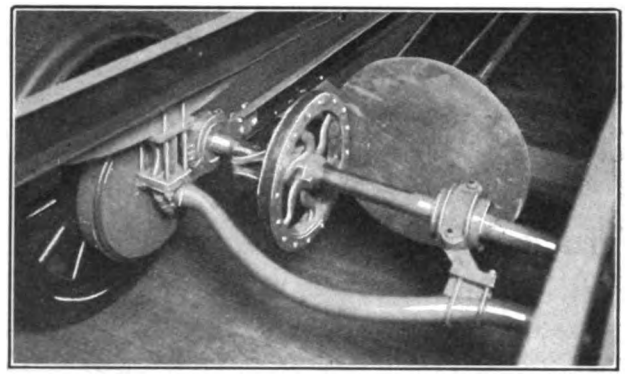
Three different makes of engines are employed, those on the 1- and 3½-tonners being of Waukesha manufacture, a Reutenber on the 2-ton model and a Wisconsin on the 5-tonner. The Waukesha engine on the 1-tonner has its cylinders cast in block with the valves at the right, while that on the 3½-ton model has its cylinders cast in pairs with the valves at the left. The Reutenber on the 2-ton model has cylinders cast in pairs and valves at the right. The Wisconsin on the 5-tonner has cylinders cast in pairs with valves opposite in the T-head type. The engines in all models are located under conventional bonnets forward of the dashes.

Water cooling is by centrifugal pump in all four units, employing case-cast radiators with vertical finned-tube cores, except on the 5-tonner, which has a cellular core. Stromberg carbureters are used on all models and are fed by gravity to the engines from tanks under the drivers' seats. Even the 1-tonner is equipped with a governor. The Waukesha engines are fitted with Waukesha governors, while the Reutenber on the 2-tonner has a Pierce, and similarly the Wisconsin used in the 5-tonner.

Ignition is on the single system in the three smaller models, which employ a Bosch high-tension magneto. The 5-tonner has a dual system with a Bosch magneto and dry cells as a second current source. Borg & Beck dry-plate clutches are used on all models.

From the clutches, the power is taken to three-speed selective gearsets of Covert manufacture, mounted amidships to reduce the free lengths of shafting and prevent whipping. Both the front axles and the worm-driven rears are of Sheldon manufacture. Both sets of brakes in each case are on the rear wheels, the type being the dual internal-expanding variety. Rolled channel frames of the semi-flexible type are used on each unit of the line.

Left steer and center control are employed on each model, Lavigne steering gear being used.



The Metz friction-change-speed mechanism as combined with an internal-gear-driven rear axle in the Metz 1-ton truck selling at $695 in the chassis

Metz 1-tonner Has Friction Drive and Internal-gear Axle

METZ SPECIFICATIONS

Capacity, lbs.	2,000
Price	$695
Wheelbase, in.	130
Tires, front	31x3½
Tires, rear	32x3½
Bore, in.	3⅛
Stroke, in.	4
N. A. C. C. hp.	24.22
Final drive	Int.-gear

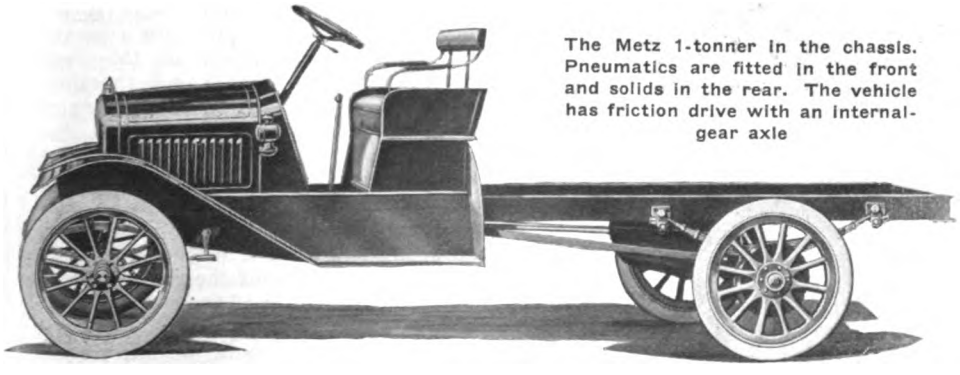
COMBINING the well-known Metz friction drive with an internal-gear-driven rear axle, the Metz light delivery truck is offered in but one model of 2000 pounds capacity. It is made by the Metz Co., Waltham, Mass., which also manufactures the Metz friction-driven passenger car. The commercial vehicle was brought out late in 1916, although shown for the first time at the Boston Show, March 3-10. It was briefly described and illustrated in the review of the new trucks at the Boston Show as published in the March 15, 1917, issue of THE COMMERCIAL VEHICLE. The truck in the chassis is sold at the low price of $695 and is intended to meet the demand of the small merchant for a low-price motor capable of doing the work of a team of horses at the same price but with the added advantage of extending the delivery radius if necessary.

The vehicle is equipped with the Metz four-cylinder motor mounted under a hood forward of the dash in the conventional manner. The cylinders are cast in block, with the valves at the right. Water cooling on the thermo-syphon system is employed in connection with a vertical finned-tube radiator having a pressed steel case.

The carbureter is mounted on the right of the motor and is fed by gravity from a cylindrical tank carried under the driver's seat. No governor is fitted due to the light capacity of the truck and the necessity for making good speeds in order to cover a large delivery area. Ignition is on the single plan with a Dixie high tension magneto. Fixed spark control is used.

From the motor the power is taken through the clutch to a large alloy steel driving plate placed transversely of the frame and contacting with a longitudinally-placed fiber-ringed driven wheel. The latter is carried loosely on a transverse shaft supported in clamps around the dead rear axle. Both the driving and driven disks, together with the shaft on which the latter is carried, are mounted on a special subframe made up of two side members pivoted to the chassis frame on each side just aft the motor at the front, and at the rear to the clamps around the dead axle. The latter and the live axle, on the ends of which the small internal spur gears are mounted, are kept in their proper relative positions by means of the two clamps at the ends and another at the center of the dead axle. The special subframe and the springs take care of the driving stresses and the torque.

The driven disk is manipulated from a center control lever in the cab so as to move across the face of the driving gear and give seven speeds forward and one reverse. The frame is of channel section, of the same depth throughout its length. Pneumatic tires are used in front and solids in the rear. Left steer is employed. The equipment furnished as stock includes the seat, lamps and jack and a set of tools.



The Metz 1-tonner in the chassis. Pneumatics are fitted in the front and solids in the rear. The vehicle has friction drive with an internal-gear axle

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Accessories for the Truck

Truck Stop Signal Has An Automatic Semaphore

DESIGNED by a former railroad conductor, G. W. Comer, and made by the Auto Signal Co., Chicago, a new type of rear end stop signal for passenger cars and motor trucks incorporates a railroad type semaphore with the rear tail light and license plate. The semaphore is pivoted to a triangular plate at the top of the license plate bracket, and is manipulated by levers every time the brake pedal is pushed down, so that it raises from a vertical position behind the plate to a horizontal position at the side, where it may be seen by the driver of a following vehicle.

In the daytime the word Stop appears in white letters on a red metal semaphore board that can be plainly read at a distance of 200 feet. At night the letters, which are made of opaque celluloid, are lighted from within by the tail lamp forming a part of the device, so that they may be seen at the same distance as the unilluminated letters in the daylight. The device is shown in Fig. 4.

Tracford for Trailer and Farm Service

DESIGNED for use either as a tractor to haul wagon semi-trailers or as a farm vehicle, the Tracford attachment, made by the Standard Detroit Tractor Co., Detroit, consists of a pair of large steel-tired rear wheels driven by means of small roller pinions mounted on the ends of the regular Ford axle in place of the rear wheels. The wheels are carried on a dead axle bolted to the regular Ford chassis forward of the rear end. Each wheel is provided with a large internal gear and is revolved through the meshing of the internal gear with the small roller pinion mounted on the Ford axle end.



Fig. 2—The Tracford with smooth-tread rear wheels for commercial service in hauling wagon semi-trailers

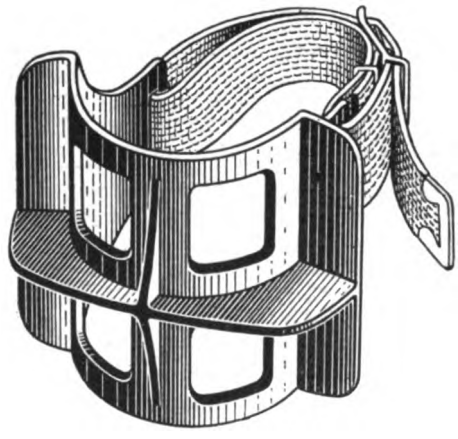


Fig. 3—The Fulton mud hook, made of malleable iron and designed to be strapped over pneumatic tires to secure traction

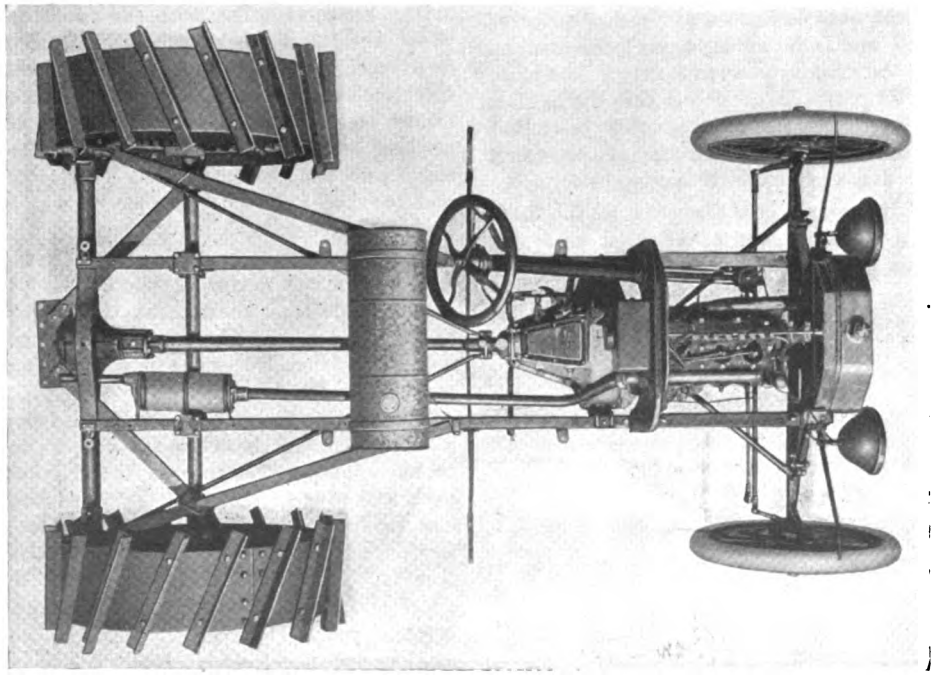


Fig. 1—The stripped chassis with the Tracford attachment in place. Note how the regular Ford axle is used to form the jackshaft for the internal-gear drive

The rear construction is further strengthened by means of two side braces bolted to the side members of the Ford frame directly at the rear end of the motor crankcase. These side braces are attached to the dead axle carrying the large wheels and extend aft, where they are pivoted to clamps near the ends of the regular Ford axle for greater rigidity. Additional braces are run from the under side of the ends of the dead axle to a plate at the rear of the end cross member of the Ford frame.

When used as a tractor to haul a semi-trailer, the only body change necessary in a roadster model is the removal of the rear deck housing and the mounting of some form of fifth wheel. For ordinary road work the rear wheels of the Tracford attachment are not provided with any projections in order not to damage the road surface. When used as a farm vehicle, cross bars in the form of angle irons are bolted to the treads of the rear wheels to secure greater traction in soft ground.

To attach the Tracford device, the Ford rear wheels, fenders, rear spring and runningboard hangers are removed and a ½-in. hole bored in the Ford frame on each side at about the midpoint of its length. A circulating water pump is furnished to replace the thermo-syphon cooling system of the Ford. It is claimed that the Tracford may be attached to the Ford in 2 hours and removed and the regular Ford wheel equipment again fitted in 1 hour.

The relative sizes of the roller pinions mounted on the ends of the regular Ford axle in place of the rear wheels and the large internal gears on the tractor

(*Continued on page* 33)

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Fig. 4—The Comer semaphore stop signal which is incorporated with tail-light and license plate

wheels is such that the final gear ratio is 9 to 1.

The unit as used in commercial service is shown in Fig. 2, and a plan view of the chassis with the attachment fitted with farming wheels in Fig. 1.

Unity Ford Attachment for 1250-pound Load

THE Unity Ford adapter made by the Unity Motor Truck Co., Cleveland, Ohio, and selling for $150, consists of a rear-end frame and springs and an extension shaft and brake-rod extension. The frame, which is 100 in. long and 38 in. wide, is attached to the regular Ford frame by six clamps, two on each side member and two on the rear cross member of the Ford frame. The extension propeller shaft is fitted directly aft the gearset housing and enables the angle of drive from the universal joint to the differential to remain the same as in the regular Ford chassis.

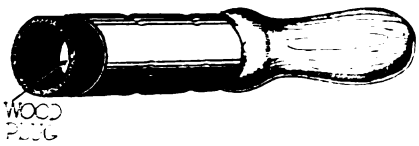


Fig. 5—The Saybrook brush for removing carbon in engine cylinders

By means of the extension propeller shaft the wheelbase of the Ford is increased to 120 in. This, with the attachment frame, gives a complete frame length of 150 in. and permits fitting a body 30 in. wide by 7 ft. long back of the driver's seat without overhang. The Ford rear axle, wheels and tires are employed and the gear ratio between the regular Ford engine and the rear wheels is unchanged, 3.63 to 1. The final gear ratio is not changed, as in most Ford adapters, because the load is only increased approximately 450 lb. over the 800-lb. capacity for which the Ford was designed. This enables the usual speed of the Ford car to be approximated when the Unity attachment is fitted.

The load is carried on the regular Ford spring perches and housing which support the spring shackles of the two auxiliary semi-elliptical springs furnished with the outfit. These are attached to the adapter frame by special spring hangers. While the rear axle is relieved of most of the load it is strengthened and braced by two heavy steel rods that cradle the differential in order to insure perfect alignment of the rear axle and wheels. The outfit is shown attached in Fig. 6.

Fulton Mud Hooks for Pneumatic Tires

MADE of malleable iron, Fulton mud hooks, manufactured by the Fulton Co., Milwaukee, Wis., are designed to be strapped over pneumatic tires on trucks of comparatively light capacity to enable them to pull out of mires. They are sold in pairs, one for each wheel, and are strapped in place only when the vehicle has become mired. The mud hook itself is shaped to fit over a pneumatic tire, and at the bottom, or that portion nearest the wheel felloe, is provided with slots to accommodate a canvas strap and buckle to hold the device in place. That portion of the hook which fits down over the tread of the tire is perforated by four small rectangular openings. A flange is provided at the center of the hook and parallel with the vehicle axle. This flange is slightly curved at the top and digs itself into the ground as the wheel revolves. This flange meets in two other flanges at right angles on each side of the hook. The latter tends to lift the vehicle as the hook becomes immersed in the mire, and also prevents the hook from turning sideways under strains. The hook is shown in Fig. 3; is made for 3½, 4-, 4½- and 5-in. tires, and sells at $1.75 per set of two.

Saybrook Brush for Carbon Removal

DESIGNED for the removal of carbon from the cylinders of engines with detachable heads, the Saybrook carbon brush consists of a small wooden handle with a ring of Swedish steel bristles at one end. The bristles are anchored in a metal ferrule at one end by means of a hardwood plug driven into place inside of the bristles under a 2-ton pressure. After this has been done the ferrule is crimped at the midpoint of its length. This crimp and the pressure of the plug forcing the bristles out against the ferrule form a positive lock so that the bristles cannot come out in service.

The plug is set back from the end of the ferrule for a distance of ⅞ in., giving a circle of inches ⅞ in. long on the inside and 5/16 in. long on the outside of the ferrule. This gives sufficient flexibility to the bristles to permit them to bend slightly and reach any corners of the engine where carbon has been deposited. The bristles wear for a considerable length of time so that it would be impracticable to attempt to replace them after they have worn down. The brush is made by the Chapman Bros. Co., Saybrook Point, Conn. It is shown in Fig. 5 and sells for 50 cents.

War Truck Repairs

(*Continued from page* 20)

enemy shell. The wreckage was so complete that convoys passed over the spot all night without realizing that anything had happened. It was only when the driver and his mechanic were reported missing and a search was made that their remains and some wreckage of the car were discovered.

Disabled and wrecked machines are never allowed to remain long in the war zone. In the first place, they are an obstacle to traffic, and, secondly, there are always some parts worth saving, and which would be stolen by drivers if the army did not collect them. During times of stress the wrecks may be allowed to lie for a few days or a week, but immediately the severe fighting is over, break-down gangs are sent out to gather up the wreckage. Sometimes a road will be closed to all traffic for a few hours in order to give the breakdown gangs a free hand, for it is obviously difficult to get big cars and trucks out of the ditches if normal traffic has to be maintained at the same time.

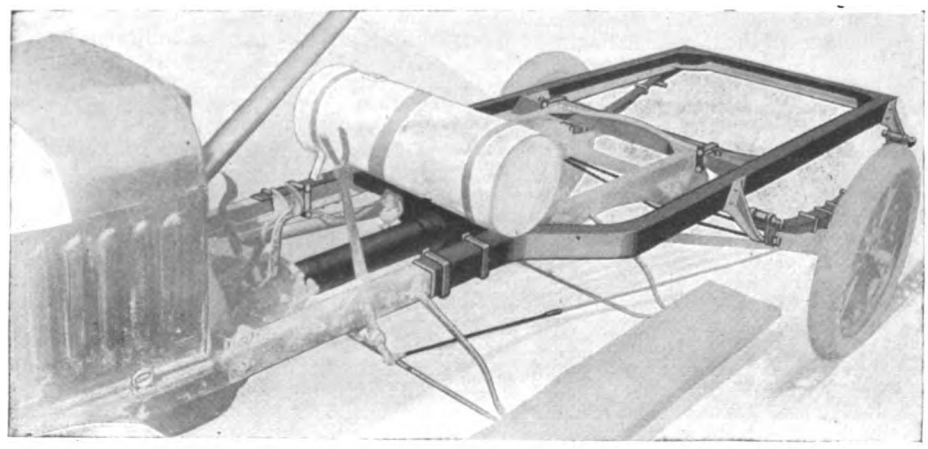


Fig. 6—The Unity Ford attachment, showing the six clamps employed to join it with the regular Ford frame—the Ford axle is used intact

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Men and Makers



FEDERAL Motor Truck Co., Detroit, is adding 500 ft. of railroad loading platforms to its present shipping facilities. New sidings connect with these additions which will aid shipments. Several service elevators have been installed in the factory buildings, and additions have been recently made to the stock and manufacturing rooms.

Ford Motor Co., Detroit, has introduced motion pictures to warn its employees against factory hazards. Each afternoon several hundred workmen selected from the different departments gather in the company's auditorium and see the safety reel which shows how personal care as well as mechanical devices are needed to prevent accidents.

Packard Motor Car Co., Detroit, has formed a technical service board composed of experts from the eight largest points in the Packard organization. This board will convene monthly at the factory under the chairmanship of C. R. Lester, technical service manager, to discuss the general conditions of service and analyze particular problems.

Diamond T Motor Car Co., Chicago, has been moving into a large new plant at West Twenty-sixth Street and Kilbourne Avenue. The buildings recently erected cover 125,000 sq. ft. of the 10 acres controlled by the company. The stock rooms are 400 ft. long and have doorways every few feet which lead out to a loading platform along which runs a service switch. This takes care of the incoming freight. The outgoing product is sent out on another line, and the road bed is depressed so as to bring the car floor level with the factory loading platforms. The old Diamond T plant at 432 Superior Street has been operating night and day.

Smith Motor Truck Corp., Canadian branch, has established headquarters at 120 King Street, East Toronto. This branch will distribute the Smith Form-a-Truck in the Dominion.

Vim Motor Truck Co., Philadelphia, Pa., has increased the wages of its employees 10 per cent. This applies to its Pittsburgh, Pa., factory, as well as to the Philadelphia plants. There has been a reduction of the working hours of the week of 2½ hr. This does not affect the increase in wages, as the 10 per cent is an actual gain over the former wages payable under the shorter time schedule.

Maxfer Truck & Tractor Co. has moved into its new plant at Harvey, Ill., which has ten times the floor space of the factory formerly occupied by the company. The production rate in the early part of this month was advanced to 300 units per day and another increase in the schedule is contemplated within the next 2 months.

Nash Motors Co., Kenosha, Wis., recently shipped a solid trainload of motor vehicles to the H. Barcroft White Corp., Nash distributor in Syracuse, N. Y. This is the first shipment of that size to leave the factory at any one time. It includes 12 Jeffery Quads and 28 Jeffery trucks. The company has offered its unoccupied land to its employees for garden use. The company will plow and harrow the tract at its own expense and will allot plots to applicants. Over 500 have already asked for assignments. The workers held a patriotic parade on April 27 with 3000 employees in line. Fifteen foreign countries were represented among the naturalized American citizens who marched. C. W. Nash addressed the workers urging them to enlist.

Hayes Diefenderfer Co., New York, has secured new quarters affording 30,000 sq. ft. of floor space at 1872 Broadway. The company is the maker of the Hay Dee extension unit for Ford cars.

Rosenstein, Simmonds & Co., New York, has been appointed distributer of the Corbitt Motor Truck Co. products for New York State. The Corbitt factory is at Henderson, N. C., and makes a complete line of worm drive trucks from 1 to 5 tons, using Sheldon axles and springs, Continental motor and Brown-Lipe transmission.

Howard B. Smith, Inc., Buffalo, N. Y., has been appointed western New York and northern Pennsylvania distributer for the Kissel Motor Car Co. products.

Z. & W. Motor Co., Inc., has opened sales rooms in Brooklyn, N. Y., to handle Vim delivery cars, Burford and Koehler trucks. Emil Zimmerman and Fred Winters are the founders and incorporators of the company.

Lockwood & Co., Memphis, Tenn., have been appointed dealers for the Kissel cars and trucks.

Goodyear Tire & Rubber Co., Akron, Ohio, has placed its tillable land under cultivation. The labor for this work is being recruited from the ranks of the company employees. The land in question amounts to over 100 acres. There are additional tracts which may be utilized if the labor response is adequate. The acreage surrounds Fritch's lake, which is to be used as a reservoir to supply water to the factory. The company is holding military drill for its men. The workers are encouraged to plant gardens in their back yards. The company will keep positions open for all employees enlisting for military duty.

Lee Rubber & Tire Corp., Conshohocken, Pa., plans for a production of 35,000 tires during May. The April output was 27,000.

Gurney Ball Bearing Engineering Bulletin, No. A-3, published by the Gurney Ball Bearing Co., Jamestown, N. Y., deals with the application of Gurney bearings to the internal gear drive. The bulletin contains eight drawings explaining the use of the bearings, a group of half-tones and a millimeter-inch conversion table.

Stone-Thompson Mfg. Co., Chicago, is the new name for the wholesale and manufacturing department of the Universal Rim Co. The latter name will be used in the future for that branch of the organization which has in charge the patents, royalties and license governing the manufacture of Baker rims. The Stone-Thompson company will distribute Baker rims and manufacture Stone shock absorbers.

S K F Ball Bearing Co. of California, San Francisco, Cal., has been organized to sell S K F ball bearings. A staff of engineers will be maintained at this office to answer any questions of ball bearing users.

Hoover Steel Ball Co., Ann Arbor, Mich., is adding three new brick and concrete buildings to its present plant. When completed the addition will represent an investment of $250,000.

New Departure Mfg. Co., Bristol, Conn., is supplying the New York Aeroplane Co. with bearings for use in military hydroplanes which have been contracted for by the United States Government.

Vesta Accumulator Co., Chicago, Ill., manufacturer of the Vesta truck lighting equipment, has secured the contract to light the 100 motor vans of the Spillman Bros. motorized circus.

Bigsby Rotary Mfg. Co., Cleveland, Ohio, is the new name of the organization formerly known as the Vital Mfg. Co. The company will continue to manufacture spark plugs.

John N. Willys, president of the Willys-Overland Co., Toledo, Ohio, has returned to his executive offices after a brief vacation.

W. J. Foss was elected second vice-president in charge of sales of the Pierce-Arrow Motor Car Co. at the annual meeting of the board of directors of the company held recently in Buffalo, N. Y. He was formerly commercial manager of the company and also a director.

H. H. Doering has been appointed sales manager for Rauch and Lang electrics made by the Baker R. & L. Co., Cleveland, Ohio. He has been manager of the Cleveland branch of the company.

N. Wilson has resigned his position as assistant traffic manager of the Maxwell Motor Co. to take a similar office with the Harroun Motors Corp., Detroit.

James Studebaker, Jr., has been made a member of the executive committee of the Studebaker Corp., South Bend, Ind., succeeding his father, the late J. M. Studebaker.

F. Studebaker Fish has been elected a member of the Studebaker Corp., South Bend, Ind., to fill a vacancy caused by the death of Nelson J. Riley.

W. B. Jameson, formerly in charge of the New Castle, Ind., plant of the Maxwell Motor Car Co., has been appointed factory manager of the Briscoe Motor Corp., Jackson, Mich.

Dawson Blackmore has become director of sales of the O. Armleder Co., Cincinnati, Ohio, manufacturer of Armleder trucks. Mr. Blackmore was formerly president of the Krell Piano Co.

Robert T. Gebler has been made advertising manager and assistant sales manager of the Martin Truck & Body Corp., York, Pa., maker of Atlas trucks. He was formerly advertising and sales

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manager for the Keasbey & Mattison Co., Ambler, Pa.

Clifford V. Herbert, who has been working on the development of a motor tractor, as was announced in the last issue of THE COMMERCIAL VEHICLE, has taken his invention to Suffern, N. Y., for demonstration before representatives of European countries.

William C. Mullin has been appointed service manager of the Thornton-Fuller Automobile Co., Philadelphia, Pa., distributer for Dodge motor vehicles. He has been in the sales end of the organization for some time, and recently made a trip to Detroit to familiarize himself thoroughly with the service end of the business.

William J. La Casse has been appointed Pacific Coast supervisor for the Maxwell Motor Co., with jurisdiction over Oregon, Washington, Idaho, Utah, western Montana, California, Nevada, Arizona and Hawaii. His headquarters will be in Portland, Ore. He was formerly Pacific Northwest zone distributer for the company.

A. J. Gibson has been made truck sales manager for the Paige Motor Sales Co., Seattle, Wash., distributer of Rainier trucks. He was formerly with the Garner Motor Co., Chalmers dealer in Seattle.

Harry L. Loop Jr., has joined the staff of the Rands Auto Co., Philadelphia, Pa., distributer of Selden motor trucks. He was formerly Philadelphia branch manager of the Chase Motor Truck Co.

W. S. Barnes has joined the sales staff of the Oregon Motor Car Co., Portland, Ore., Studebaker dealer. He was formerly connected with the Portland branch of the Willys-Overland Co.

J. M. Evans has been appointed manager of the truck department of the Provo, Utah, branch of the Inter-Mountain Motor Car Co., agents for Kissel motor vehicles.

H. A. Baker, of Baker Brothers Auto Co., Detroit, Minn., Dodge distributers, has left the company to serve as lieutenant in the army.

Harold Tuttle has been appointed assistant general manager of the Howard Automobile Co., Los Angeles, Cal., Pacific Coast distributer of the Howard Automobile Co.

John V. Wilson is forming a company to handle Make-a-Motor trucks in Boston, Mass.

H. A. Grubb has been appointed Western district sales manager for the Firestone Tire & Rubber Co., Akron, Ohio. He was formerly manager of the Dallas, Tex., branch of the company.

Jesse E. LaDow is touring the Far East inspecting rubber plantations. He is secretary of the Mansfield Tire & Rubber Co., Akron, Ohio, and on his return to this country in the near future he expects to establish a shipbuilding company on the Pacific Coast.

John Brakley has been made manager of the Dallas, Tex., branch of the Firestone Tire & Rubber Co. He was formerly credit manager of the branch for the Texas territory.

J. D. Carey has been made manager of the carriage tire department of the Kelly-Springfield Tire Co., with headquarters at the general sales office, Cleveland, Ohio. He was formerly Southern district manager of the company.

Foster C. Burnett has been appointed supervisor in the Southwest for the Ajax Rubber Co., with headquarters at Dallas, Tex.

A. H. Marks, general manager of the B. F. Goodrich Rubber Co., Akron, Ohio, has joined the United States naval forces. He has been given a leave of absence from the company for the duration of the war.

H. W. Bixler has been appointed manager of the foreign department of the Republic Rubber Co. of New York, with offices in the Singer Building. He was formerly in charge of the Eastern railroad sales department of the company.

George A. Richards has been appointed special representative of the manufacturers' sales department of the Firestone Tire & Rubber Co., Akron, Ohio, with offices at Detroit. Mr. Richards has been connected with the sales department of the company for 7 years.

S. Simpson, president of the Royal Equipment Co., Bridgeport, Conn., is taking a vacation on the Pacific Coast to regain his health.

L. Cotter McHugh has joined the Royal Flying Corps, Camp Borden, Canada. He was formerly with the Detroit Steel Products Co., Detroit.

A. M. MacLaren is the manager of the main office of the S K F Ball Bearing Co. of California, which was recently opened in San Francisco, Cal.

J. N. Kelly has resigned his position as superintendent of the Ross Gear & Tool Co., Lafayette, Ind., maker of steering gears.

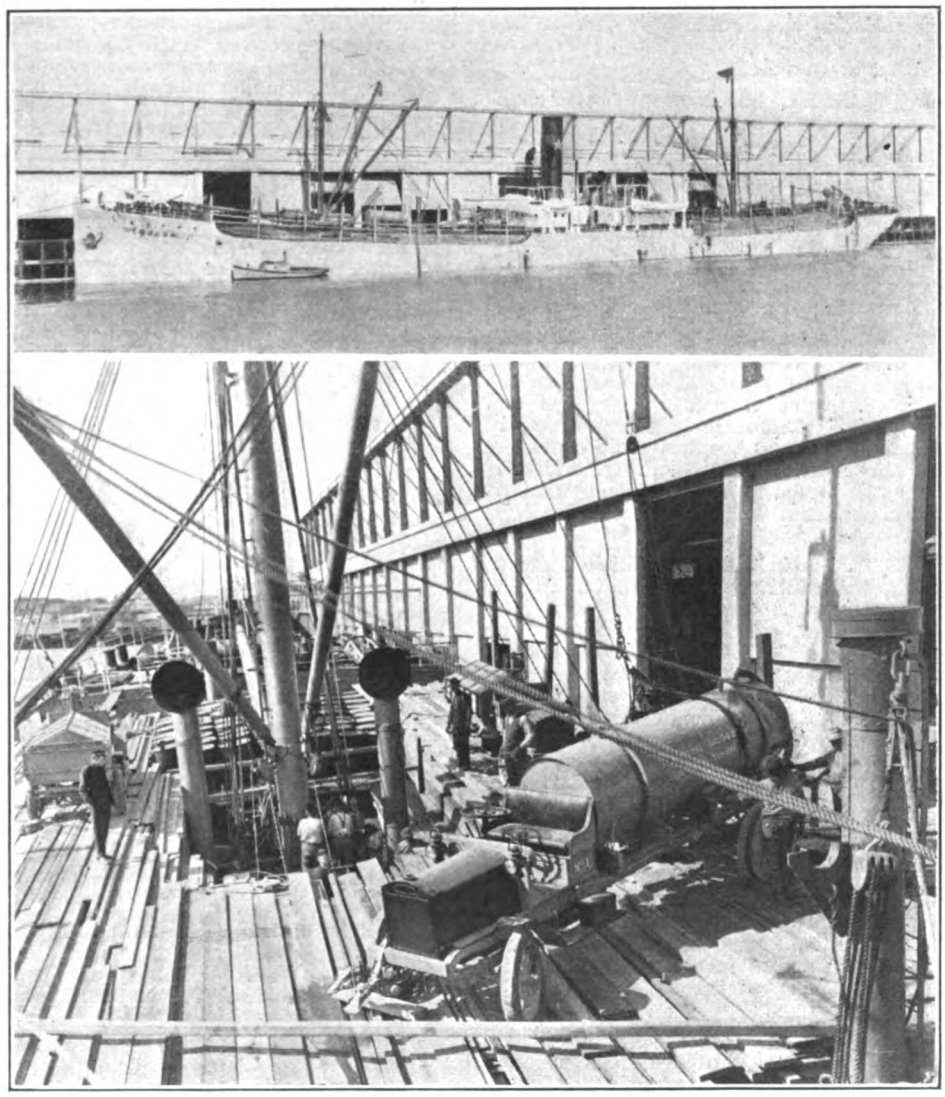
H. L. Dunbar has been named to represent the Standard Roller Bearing Co., Philadelphia, Pa., in Illinois, Wisconsin, North and South Dakota, Nebraska, Kansas, Iowa, Missouri and part of Indiana. His headquarters will be at Chicago.

H. B. Swaab has been appointed sales manager for the Standard Roller Bearing Co., Philadelphia, Pa., in the Middle West territory, which is supervised by the Western sales branch at Detroit. Mr. Swaab's headquarters will be at Indianapolis, Ind. His territory includes the State of Indiana, excepting South Bend and Michigan City; the State of Kentucky, and the State of Ohio, excepting Cleveland, Canton, Toledo and Akron.

A. N. Goodfellow has been appointed Western sales manager for the Standard Roller Bearing Co., Philadelphia, Pa., with headquarters at Detroit.

L. M. Watkins has been named to represent the Standard Roller Bearing Co., Philadelphia, Pa., in the Eastern territory. His headquarters will be at Philadelphia.

W. F. Herst has been appointed general manager of the M & S Gear Corp., Detroit. He has formerly been active head of the Brown-Lipe Gear Co., Syracuse, N. Y.



U-boats cannot stop the trade of the United States with Latin America. The upper illustration shows the S. S. Regulus, which is carrying a load of Moreland trucks to Antofagasta, Chile. The lower picture shows the Regulus alongside the municipal pier, Los Angeles, Cal., receiving uncrated trucks above a deckload of lumber

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P. W. Gilbert has been made assistant to general manager of the Standard Parts Co., Cleveland, Ohio. He was formerly manager of the rim and tube division of the company.

B. W. Quayle has been appointed sales manager of the rim and tube division of the Standard Parts Co., Cleveland, Ohio. He was formerly general sales representative for the company.

Frederick S. Lawrie has resigned as sales manager of the Spacke Machine & Tool Co., Indianapolis, Ind. He will devote all his time to his merchandise brokerage business in that city.

E. L. Usner, J. P. McParland and M. C. Griswold have been appointed to new offices in the Ross Gear & Tool Co., Lafayette, Ind. Mr. Usner is now assistant manager, Mr. McParland superintendent of machine shops, and Mr. Griswold superintendent of assembly.

Gould Allen has been appointed sales manager of Fuller & Sons Mfg. Co., Kalamazoo, Mich., maker of transmissions, clutches and other automobile parts.

J. E. Simonds has been appointed manager of the new Chicago branch of the Duplex Engine Governor Co., Brooklyn, N. Y.

Ludwig Arnson has been appointed manager of the new branch office of the Duplex Engine Governor Co., Brooklyn, N. Y., in Detroit.

C. H. Schrag has been appointed manager of the Bosch department of the Ashwell Service Station, Hartford, Conn. He was formerly with the Bosch Magneto Co., Springfield, Mass.

W. Owen Thomas has opened offices as a consulting engineer in the Garfield Building, Detroit. Mr. Thomas has been with the Canadian army as a purchaser of war materials, and in active service in Europe.

Tom O. Jones has been appointed special agent in the Far East for the United States Bureau of Foreign and Domestic Commerce. Mr. Jones will make a tour of the automobile centers of the country before sailing, and during this period he may be communicated with at Room 409, Custom House, New York City.

E. H. Steckels has established offices as a manufacturers' distributer in the United States Rubber Building, New York. He was formerly president of the Holt-Welles Co., New York, distributer of the Branford carbureter. He has, however, sold out his interests in this company to the Malleable Iron Fittings Co., of Branford, Conn.

Lee F. Hoffman, Bedford, Pa., has been developing the experiment of making a hotel an all round service station for the motor vehicle driver. He runs a garage and tire service station in connection with "Hoffman's." He has placed roadside mirrors at dangerous curves along the roads near his establishment and furnishes driver-guests with road maps, route cards and warnings of speed traps.

L. W. Kennedy is now special truck tire representative of the United States Tire Co. in the southern district. His headquarters are in Atlanta.

Fred L. Gayton, formerly with the Goodyear Tire & Rubber Co., has joined the forces of the United States Tire Co. Mr. Gayton is in the truck tire department, and will have his headquarters in New York.



By using a Troy trailer on its White 3-ton truck the Cleveland Provision Co., Cleveland, Ohio, is able to make one motor vehicle do the work of two. The outfit pictured above makes deliveries between Cleveland and Lorain, Ohio, stopping en route at Elyria. The trailer is dropped at Elyria, where it is drawn about by horses to make local deliveries. On the truck's return it picks up the empty trailer

P. E. Mills, formerly assistant chief engineer of the Eisemann Magneto Co., has recently been made sales engineer.

An Agency in Russia for Trucks is desired by the representative of a firm in the United States who expects to sail about June 1. He expects to purchase some of the product which he will sell in Russia and will operate on a commission basis. Further details may be learned by communicating with the United States Bureau of Foreign and Domestic Commerce, Washington, D. C.

"Factory" for May, 1917, contains a number of articles of interest to the manufacturer. The magazine opens with a brief foreword quoted from Howard E. Coffin, prominent in the motor vehicle world and member of the advisory commission of the Council of National Defense. There are several papers dealing with practical ways to cut production costs, the probable effect of the war on prices, the relation of wage increases to a larger output, and hints for more efficient interior management.

"The Call to the Colors," printed in red, white and blue, is a booklet published by the Russel Motor Axle Co., North Detroit, containing President Wilson's war message.

Cincinnati, Ohio, Has Big Factory Advantages, according to certain figures worked out by Robert S. Stewart, vice-president of the United States Motor Truck Co. Mr. Stewart has a chart which shows that three-fourths of the population of the United States is within a 500-mile radius of Cincinnati. The city is served by trunk line railroad, it has a water transportation route in the Ohio River, and there are good public highways radiating from the city. All these factors make it easy for manufacturing establishments to reach the main markets of the country readily.

Bulletin No. 10, the June number of the pamphlet devoted to the magazine interests of the A. W. Shaw Co., Chicago, contains a number of brief items explaining the advertising advantages of "System," "System on the Farm" and "Factory."

"Waste" is a booklet published by the Salvation Army Industrial Home, New York, which shows, incidentally, that motor trucks have their use in social service work. The pamphlet deals with society's derelicts and explains how, by collecting waste paper, cast-off garments and other rubbish, the Salvation Army is able to help the down and outers. The institution uses motor-driven vehicles in making its collection of cast-off material.

"Recreations in Mathematics" by H. E. Licks is a 106-page book whose object is to excite the interest of young students in mathematical inquiries, and it is calculated to appeal rather to the mathematical amateurs, therefore, than to experts and professors. The table of contents is logically arranged as to chapters, but within the chapter division the author has not attempted any logical method of presentation, since his aim was primarily to divert rather than instruct. The price of the book is $1.25 postpaid. It is published by D. Van Nostrand Co., 25 Park Place, New York.

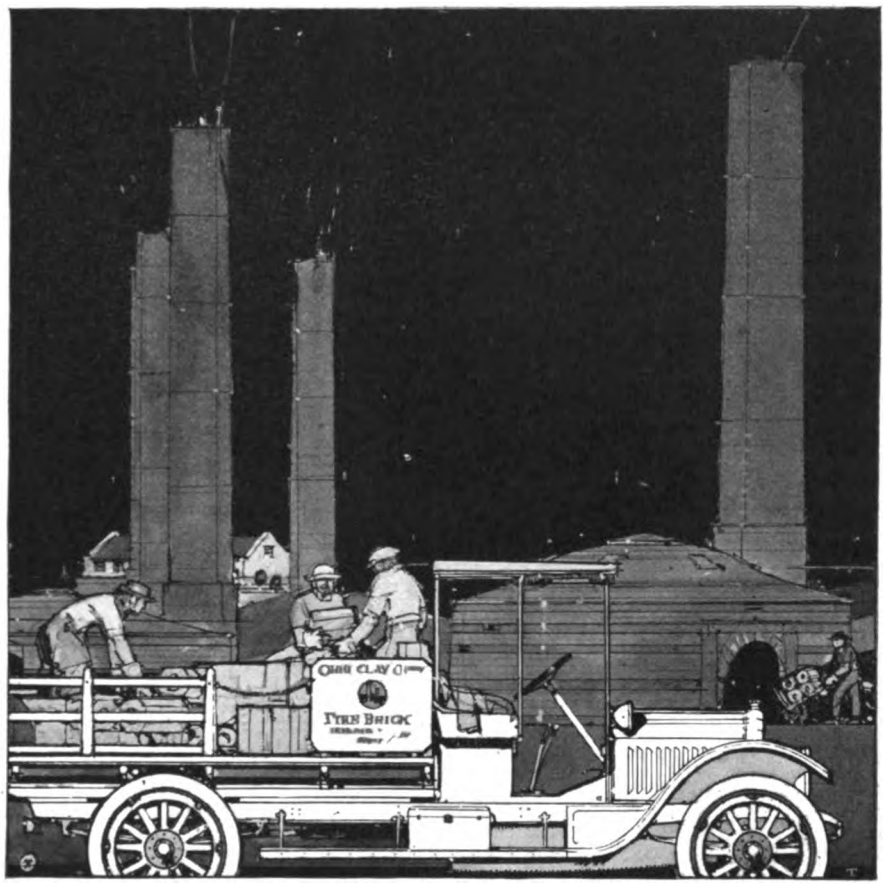
"The Trackless Train" is a catalog concerning the Mercury line of electric industrial tractors which are made by the Mercury Mfg. Co., Chicago. The booklet contains illustrations of the Mercury tractors in actual use, and explains its parts in detail. The catalog is well made. It has a heavy dark brown paper cover, and the use of brown printing on buff colored pages gives a novel and restful effect.

Hispano-Suiza Motor Co., Barcelona, Spain, will establish a factory in Guadalajara, 35 miles northeast of Madrid, according to information received and published by the United States Bureau of Foreign and Domestic Commerce. The company makes motor vehicles and aeroplane engines. American companies which are interested in supplying construction material or equipment should write to the Barcelona office of the organization for further information.

Motor Power Has Supplanted the Pony Express in Texas along the route from San Antonio to Charlotte. W. P. Wilson, an old rider on this line, has become an automobile owner and chauffeur. Instead of buying horseshoes he now invests in United States tires.

Lynite Pistons are well described and illustrated in a 20-page booklet just issued by the Aluminum Castings Co., Cleveland, Ohio. The booklet is very well illustrated with halftone illustrations showing the construction of Lynite pistons in detail, and the text follows the development of the light-weight piston and the reasons therefor.

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ROLL CALL

Of White Truck Fleets In Actual Service

THERE are 1695 White Truck Fleets now in service. These fleets comprise a total of 17,471 White Trucks, purchased in repeat orders over a period of years. No single truck owners are included in these figures.

These fleets have grown gradually to their present size and their growth accelerates rapidly from year to year. This is evidence that the longer White Trucks are in service, the more are owners convinced of their superior strength, durability and economy.

The 1917 Roll Call of White Truck Fleets will be sent to any address upon request. This Roll Call gives a complete list of owners showing their annual purchases of White Trucks since 1910.

THE WHITE COMPANY
CLEVELAND

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI February 15, 1917 No. 2

Cleanliness Chief Asset of Trucks in Butter Delivery

Fleet of Twenty 1-Ton Electrics and Three Gas Trucks Distribute Dairy Product Within 15-Mile Radius of Gotham Plant

CLEANLINESS, cheapness and advertising value were the three most important advantages accruing to motor trucks and not to horse wagons which led the Blue Valley Butter Co. to purchase an entirely horseless delivery equipment when that concern opened its New York City branch for the distribution of dairy products, principally butter, to retail stores in the Metropolitan area.

Cleanliness is one of the prime requisites in the handling of dairy products of all kinds, and especially butter, which every one knows seems to have an indefatigable capacity for absorbing the odor from other goods carried in close proximity to it.

Drivers' Hands Must Be Clean

It is also taken for granted that a driver of an electric truck gets his hands covered with grease and oil less often than one who drives a gasoline commercial vehicle, due principally to the absence of the gasoline motor and carbureter and the general tendency for gasoline truck drivers to swab off their engines, adjust their carbureters, etc. This elimination of the drivers' dirty hands was also considered, for it must be remembered that the drivers of the Blue Valley fleet are really more salesmen than drivers. They get the orders and actually deliver the goods from the trucks to the counters in the retail stores. It would have availed the company nothing after a clean manufacture of the product if it was made greasy and oily through the medium of the driver's soiled hands

Every housewife knows better than to place an uncovered crock of butter in the family ice box along with fish, green onions and lemons, if she expects [illegible] butter on her [illegible]

Butt[illegible]

S[illegible]
or[illegible]
selv[illegible]
use[illegible]
a [illegible]
gr[illegible]

sp[illegible]
d[illegible]
n[illegible]

its print butter, made from Pasteurized cream churned fresh every day, the Blue Valley company could not with consistency risk the final condition of its product as delivered to the [illegible] store by the use of anything [illegible] of vehicular

all of which is delivered.

The vehicles are lined up for loading at the curb, and the goods transported from the store to the tailboards by

The present make-up of the Blue Valley fleet in New York City consists

Stories Like These

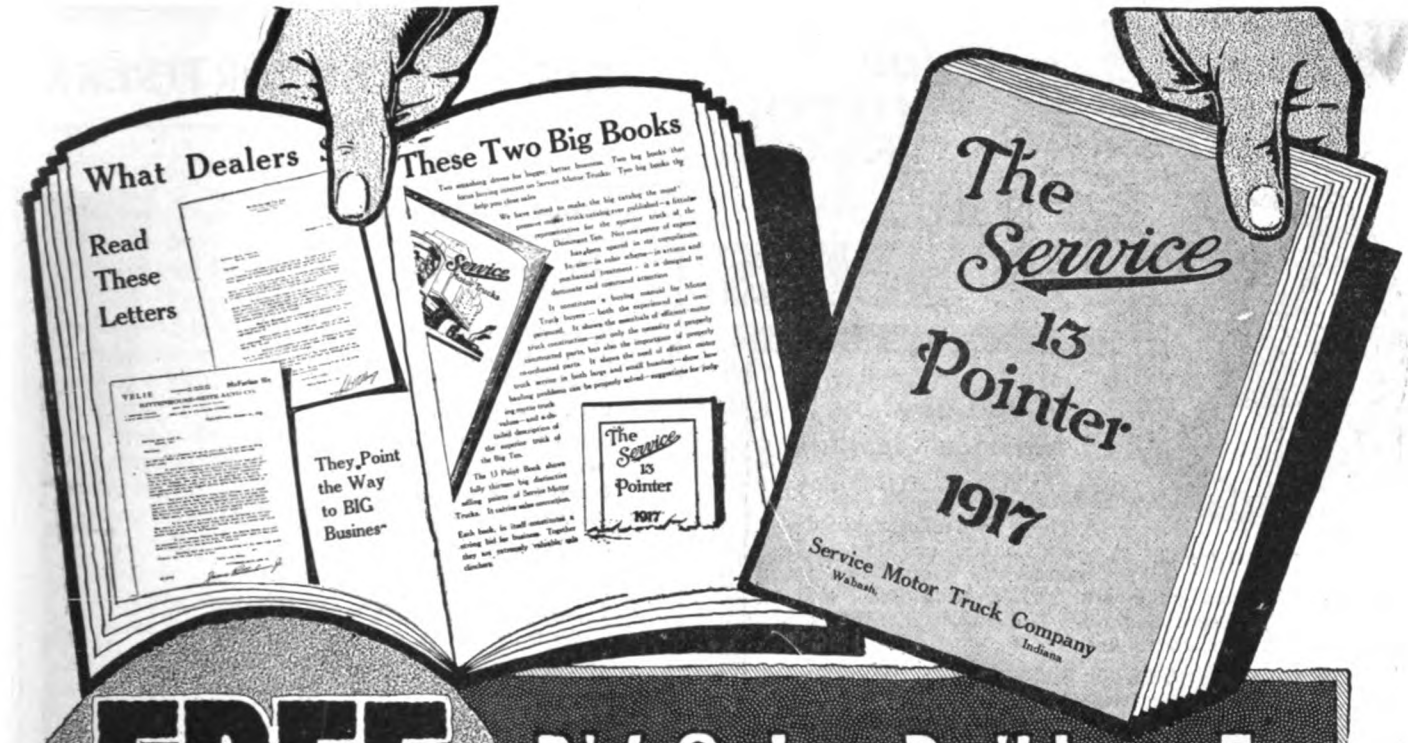
that describe with infinite care and detail the problems and experiences of men in charge of motor delivery systems of every description form only a part of the editorial service that has raised the COMMERCIAL VEHICLE to the position of supremacy among motor truck publications.

You owe it to yourself and business associates to keep posted on the developments and practices in motor transportation. The adoption of a single idea gained from such reading may save you hundreds of dollars.

Enter a year's subscription to the COMMERCIAL VEHICLE now. The cost is $2.00. If you are a subscriber why not recommend it to your friends?

The COMMERCIAL VEHICLE
239 West 39th Street New York

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FREE These Two Big Books

Big Sales Builders For MOTOR TRUCK DEALERS

NEVER before have any sales building books created such a sensation among motor truck dealers. You simply cannot afford to miss them. No matter what truck you are now handling they point the way to greater sales—larger business—increased profits.

They were written by three men recognized as the master minds of motor truck merchandising — three men whose advertising and sales successes have established records in the motor truck industry. These three men have now been engaged to co-operate with Service Motor Truck dealers.

And these books tell of the remarkable advertising and selling campaign which is now covering every big industry of the country like a fine tooth comb to secure prospective buyers — hammering away month after month with strong, dynamic, printed salesmanship to impress every business in every industry with the sales message of Service Motor Truck —making sales for dealers easier, quicker, bigger.

252 Sales Drives

See the 164 full page ads—one every month in 22 different publications reaching the 18 big industries. Also the full page ads in the big national publications, such as Saturday Evening Post.

Unequaled Co-operation

Read the intensive local campaigns designed for Service dealers. See how they "cash in" **big** on this selling campaign. See these new selling ideas—new sales plans—co-operation that not only gets inquiries for dealers but helps to close them. See the special circulars—one for each big industry. See the big 13 Pointer, giving 13 big, distinctive selling points of Service Motor Trucks. See the big buying manual for prospective purchasers — a manual designed to give buyers suggestions for judging motor truck value. Never, we think, has this dealer co-operation been duplicated.



The Wonder Truck

And backing up this co-operation is a truck of extra big value. Only five of the ten leading motor truck manufacturers use motors with the wonderful power of Service. And for equal rated capacities Service shows 11% greater power than is found in the other four. Compared with the other nine of the big ten, Service shows 11% super-strength in frames, springs, worm drive construction — secured through special materials, special heat treatments, special shapes.

6 Amazing Values

And yet duplicating point for point the accepted features of superiority found in all other trucks made by the big ten—adding extra features, which combined are not obtained elsewhere—Service Motor Trucks are sold for less than any other of the big ten.

1 ton truck	$1425	3½ ton truck	$3100
1½ ton truck	2100	3½ ton truck (Special Contractors)	3350
2 ton truck	2350	5 ton truck	4150

67% Re-Sales

It is no wonder then that 60% of 1915 production was required to fill re-orders from satisfied customers. Or that 67% of 1916 sales were re-sales to companies already operating up to 97 Service Motor Trucks in 243 different lines of business. Never, we believe, has this amazing re-sale record been duplicated.

Service Motor Truck Company
Dept. V5 — Main Office and Factory, Wabash, Indiana

Chicago, Ill.	Milwaukee, Wis.	Hoboken, N. J.
New York, N. Y.	Bridgeport, Conn.	Philadelphia, Pa.
Norfolk, Va.	Des Moines, Iowa	Rochester, N. Y.
St. Louis, Mo.	Baltimore, Md.	Tulsa, Okla.
Louisville, Ky.	Columbus, Ohio	Detroit, Mich.
Omaha, Neb.	Cincinnati, Ohio	Denver, Colo.
Boston, Mass.	Youngstown, Ohio	Knoxville, Tenn.
Brooklyn, N. Y.	Canton, Ohio	Memphis, Tenn.
Newark, N. J.	Pittsburgh, Pa.	Birmingham, Ala.
Indianapolis, Ind.	Washington, D. C.	Dayton, Ohio
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Salt Lake City, Utah	New Orleans, La.	

Send Coupon NOW

Undoubtedly you eventually intended to handle a truck made by one of the *leading* motor truck companies. Here is your opportunity to secure the dealership of the *value* truck of the dominant ten — provided we are not now represented in your locality. But you must act quickly for this opportunity will not be open long. Rest assured of that.

Send Today

Service Motor Truck Co. Dept., V5, Wabash, Ind.

Send the "Sales Maker" and 13 Pointer containing selling plans which build big business for dealers.

Name .....

Street .....

Number .....

City ..... State .....

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WEST'S CAST-STEEL WHEELS for MOTOR TRUCKS



"Patent Pending"

Are used by America's leading Truck Builders

These wheels were designed by, and are built under the supervision of, experienced engineers. They have been thoroughly tested and have proved they will stand hard usage and abuse.

Over 25,000 WEST'S CAST-STEEL WHEELS are now used on trucks and not one of them has failed to give satisfaction. Specify WEST'S CAST-STEEL WHEELS on every heavy truck you buy.

SATISFACTION GUARANTEED

The West Steel Casting Company

805-815 E. 70th St. Cleveland, Ohio

"Watch the West Cast-Steel Wheels Go Round"

GASOLINE TANKS AND MUFFLERS

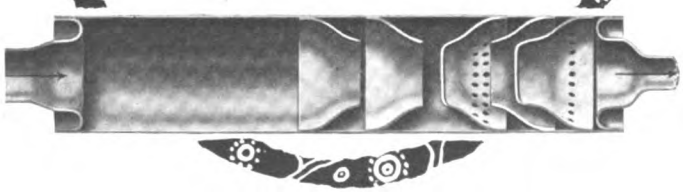
G. P. & F. Gasoline Tanks and Mufflers are built for those truck manufacturers who regard quality as the foremost factor in the construction of their product.

These parts are built in a mammoth, modern plant covering 15 acres of floor space—built to a standard which this organization has faithfully observed during its 36 years of manufacturing steel parts.

Geuder, Paeschke & Frey Co.

1423-1700 St. Paul Ave., Milwaukee, Wis.





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1½-3-5 and 7 Ton Sizes

DOUBLE end steering device of original design makes it not only possible but EASY to back trailer anywhere. Double swiveled tongue; no other trailer has it.

Also pole, semi, and pleasure car trailers.

Detroit Trailers are used by *Cadillac, Ford, Saxon, Reo, Jeffery* and other large auto concerns who know good trailers when they see them.

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The demand for trailers is increasing rapidly as you know. An agency for a good trailer is a good thing, and an Agency for the Detroit Trailer is the best proposition in the Trailer line.

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If you contemplate the use of Silent Chain, don't fail to try the "Whitney."

The Whitney Mfg. Co.
HARTFORD - - - CONN.
CHAINS — KEYS — HAND MILLING MACHINES

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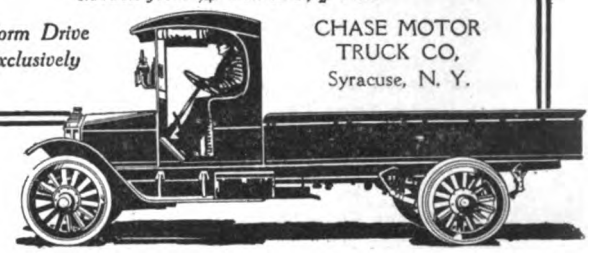
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Trade Mark Reg. U. S. Pat. Off.
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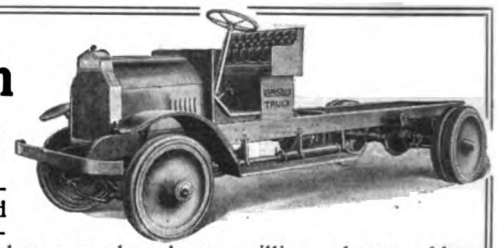
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—worm drive—built large and sturdy for severe service—always ready—always willing—always able to deliver the load wherever a motor truck can go. Made in 5 sizes—1 to 5 ton—all oversize jobs.

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is used by most makers of Motor Trucks. That is the best reason for its being on your truck. Write us about it.

Bosch Magneto Company
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Reasons Your Customers Can Understand

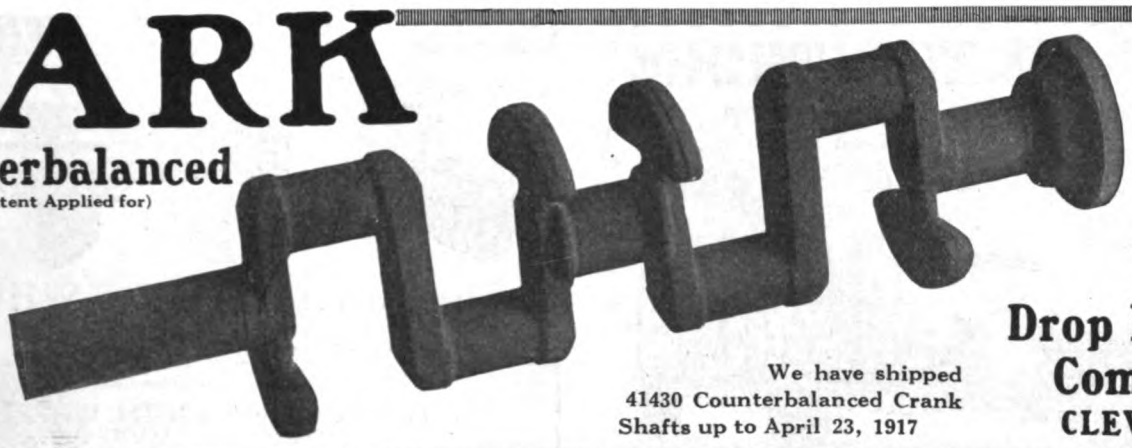
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Dept. K, Clintonville, Wis.

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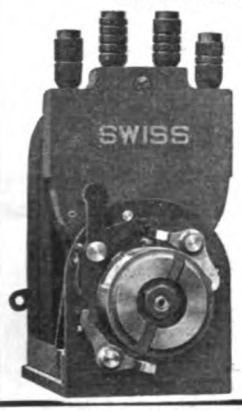
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CLEVELAND

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MONROE, MICH.

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The Pull-More Truck Will Pull More Profits For You

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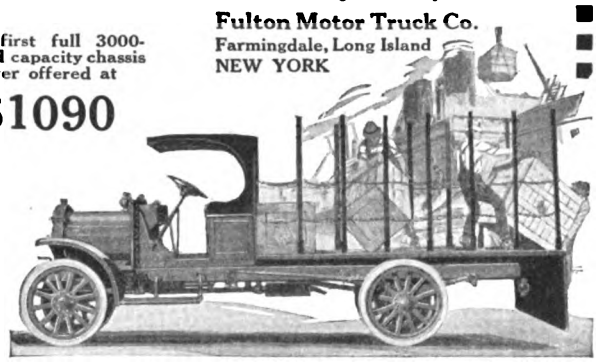
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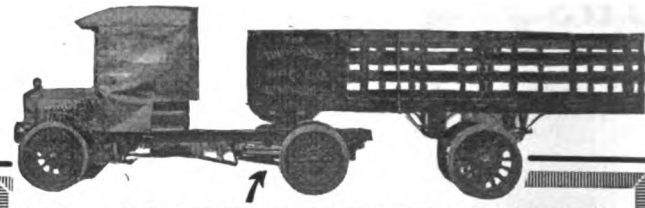
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makes possible this combination of a 1-ton Packard and a 3-ton Fruehauf trailer.

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It has been our endeavor to create a commercial vehicle that would excel first of all in the quality of the material used, and second, in the economy of its operation.

Our reputation for producing the most lasting truck is recognized by our many users.

We offer for your convenience the following sizes:

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2 " 5 "
7 ton

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Our entire engineering force is at your disposal.

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$325 Tonford $325
TRADE MARK

All the facts that sell the Ford, sell the Tonford. Highest grade truck attachment made—easiest to attach—strongest, most durable. Best constructed truck unit on market—lowest priced. Get busy now, while territory is still open. Write today. Learn how "Tonford" dealers pile up profits.

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Model 67—Maximum 6000 Pounds

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KENOSHA, WIS.

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KENOSHA WISCONSIN

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Heavy Duty Hoist with Standard Coal Dump Body

EASE of operation is one important reason for WOOD hoist supremacy. There are, naturally, others.

NINETY per cent of the truck makers in this country list WOOD bodies as standard equipment—*why?*

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WOOD HOISTS
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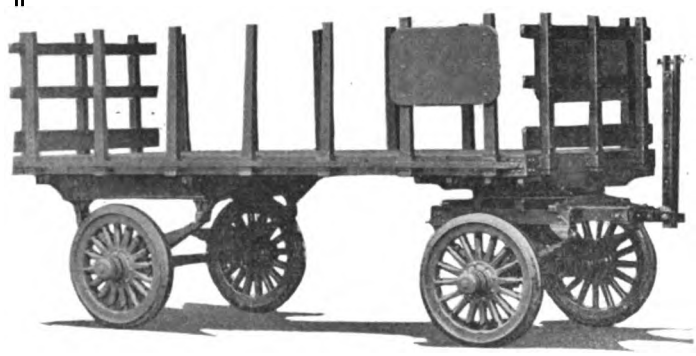
WATSON TRAILERS and SEMI-TRAILERS

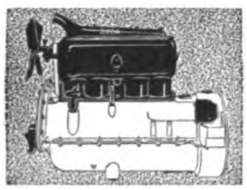
STRONGEST, most highly efficient and most profitable line for dealers who desire to meet every class of competition.

The only Bottom Dump Trailers and Semi-Trailers on the market. Platform Trailers and Semi-Trailers and Watson Chassis for Special Bodies. A type and tonnage for every hauling job, every load, every business, every user.

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The BUDA MOTOR

is an expression of our one ideal—Quality; and this is attained through conservative engineering plus conscientious workmanship and the fact that—

OUR CAPACITY, though large, has grown solely on the basis of the number of motors we could produce carefully, test thoroughly, guarantee positively. It is kept squarely on that basis. When a BUDA MOTOR goes into your assembly our reputation goes with it. We cannot afford to forget that, and—*neither can you.*

THE BUDA COMPANY, HARVEY, (Chicago Suburb) ILL.

—Sheldon Springs—

Designing a truck presents no nicer problem than that of providing it with springs.

No concern in the world is as well prepared to solve this problem—none with the amount of experience—none with the varied experience—none with the facilities and equipment, either human or mechanical, that the Sheldon Axle and Spring Co. offers.

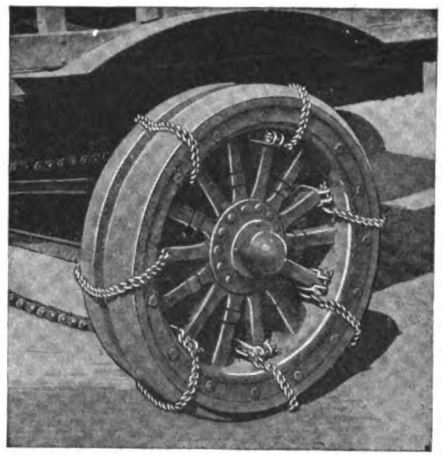
Collectively—these facts are the reason why the service Sheldon Springs will give is a known quantity and a guaranteed quantity.

SHELDON AXLE and SPRING COMPANY
Wilkes-Barre, Pa.

Makers of Springs and Axles for Heavy Duty Service for more than 50 years.

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Prest-O-Grip Anti-Skid Chains

(For Solid Tires)

The high standard of material required to meet our specifications insures Prest-O-Grips against breakage.

The clamp, rubber lined to prevent wearing the spoke, stays on the wheel. The patent lock link makes it easy to attach and detach the chain without jacking up the truck. It cannot open accidentally.

Prest-O-Grips are made for any size truck. Why not insure your truck against accident and excessive wear of the tires? Fully Guaranteed.

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Best axles use Thermoid Brake Lining



Celfor



American



Timken-Detroit



Empire

Judge a brake lining by its users.

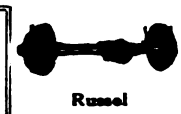
Notice that experts select Thermoid Brake Lining. Read this list of prominent axle makers who use Thermoid Brake Lining:

Timken-Detroit
Columbia
Peru
Sheldon
Russel
Celfor
Empire
Hess
American
Torbensen

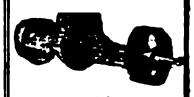
Remember to specify Thermoid when you have your brakes relined. It costs little more and is well worth it.

We guarantee Thermoid Brake Lining. Our guarantee has no ifs, ands, or buts. It is simply this:

We guarantee Thermoid to have a more uniform gripping power and to outwear and give more satisfactory service than any other lining. *Thermoid will make good—or WE WILL.*



Russel



Sheldon



Hess

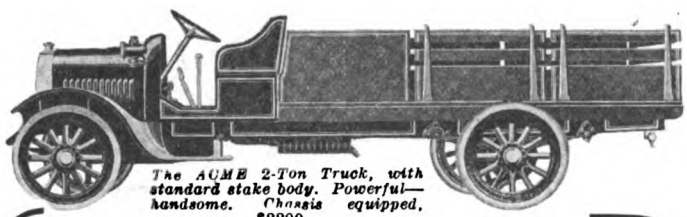


Torbensen

Thermoid Rubber Company

Trenton, N. J.

Makers of "Thermoid Tires" and "Thermoid Garden Hose"



The ACME 2-Ton Truck, with standard stake body. Powerful—handsome. Chassis equipped, $2200.

Fill Immediate ACME Orders!

DEALERS: Get the quick, profitable business of local truck buyers who know the advantages of ACME Trucks and want them for early delivery. The surest selling features to meet customers' requirements for from 1-ton to 3-ton capacities.

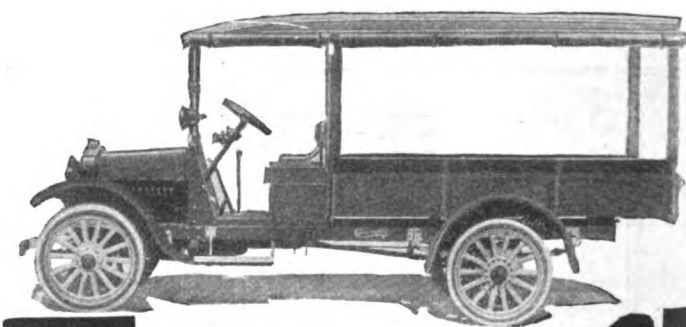
Clinch the ACME Agency now—and sell easily, with substantial profit. No large service to render because of fifteen famous "Proved Units" from radiator to tail light. ACMES have oversize dimensions. The 2-ton ACME has powerful 40 H. P. Continental Motor and big capacity—Chassis, equipped $2100.

ACME THE TRUCK OF PROVED UNITS

Be in a position to accept big business on our One-Ton Truck. Announcement and specifications sent on request. An all-feature worm drive ACME —$1575.

Write for Booklet, "A Business Builder," and Territorial offer today. Or WIRE—

Cadillac Auto Truck Co.
14 Mitchell Street
CADILLAC, MICHIGAN



Commerce

TRUCKS
1 TON CAP

A Year Ahead *of* Other Trucks

The only truck having everything necessary on it—when you buy it

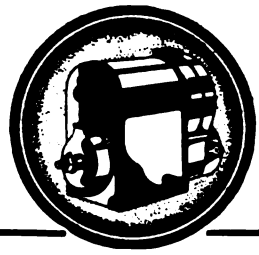
Three types of bodies for all models—Remy Starting and Lighting—Stewart Vacuum System—Pierce Governor—Windshield—Bumper.

Continental Motor—Torbensen Rear Axle—Detroit Steel Products Company Springs. Price—$1350 f.o.b. Detroit.

The Commerce Motor Car Company
DETROIT MICHIGAN

W. H. Brinkerhoff, Eastern Dist. Mgr.
Belmont Ave., Elmhurst, Long Island, N. Y.

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Character Witnesses for Eisemann

Motor Truck use is the hardest, therefore the best test of a Magneto.

Take the testimony of the Motor Truck Makers—by counting noses if you like; or, better still, by selecting the recognized leaders.

Among the 69 who use the Eisemann as standard equipment are: Federal, G. M. C., Gramm-Bernstein, Kelly, Pierce-Arrow, Service, Sterling and White.

Only one consideration could decide such leaders as these—not sentiment, not price, not salesmanship—efficiency!

THE EISEMANN MAGNETO CO.
Sales and General Offices: 32-33rd St., Brooklyn, N. Y.
Chicago, Ill., 910 S. Michigan Ave. Detroit, Mich., 802 Woodward Ave.

THE EISEMANN MAGNETO

Cut Down Expenses with GOODRICH DE LUXE TRUCK TIRES



You reduce both operating expenses and depreciation charges when you equip your trucks with **Goodrich De Luxe** truck tires. They make lay-ups for tire changes less frequent—likewise lay-ups for repairs to the truck.

The deeper tread absorbs much of the vibration so destructive to truck mechanism. It means long life to the truck as well as to the tire. This double saving gives truck users another reason for saying that **Goodrich De Luxe** truck tires deliver "Velvet Mileage."

Prove this conclusively by using our Motor Truck Expense Record Books which we furnish upon request.

The B. F. Goodrich Co.
AKRON, OHIO

1000 Pound Capacity Sheridan Commercial Car

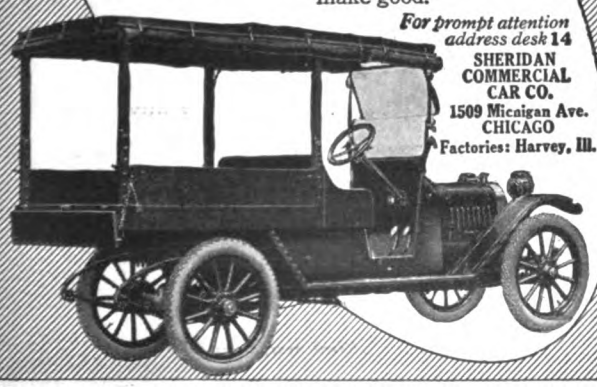
Ready for Delivery Now

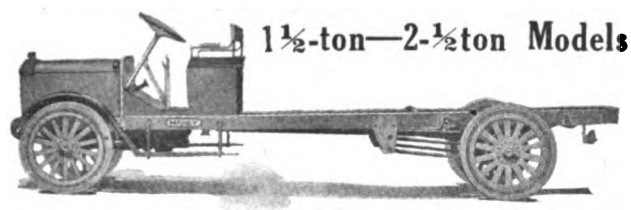
Fully Equipped Price $540

THE SHERIDAN is the lowest priced delivery car on the market. Thoroughly equipped and properly built to do the work it's designed for—haul 1000 pounds any time—anywhere. Ample in size, load capacity and power.

Sells fast to a big, ready-made field of *buyers*. Not a rebuilt pleasure car. Made a truck through and through by manufacturers of trucks, to replace horses where price is what counts. Chassis alone, **$490.** Fully equipped, **$540.** Write or wire for complete details. Make territorial reservations now. Dealers make good.

For prompt attention address desk **14**
SHERIDAN COMMERCIAL CAR CO.
1509 Micaigan Ave.
CHICAGO
Factories: Harvey, Ill.





America's New Quality Truck Has 20 Remarkable Features—

features proven in the fire-test of actual service to be of money-saving merit to users and sales creative value to dealers. These set MANLY Trucks in a class far up among quality commercial vehicles.

MANLY TRUCKS

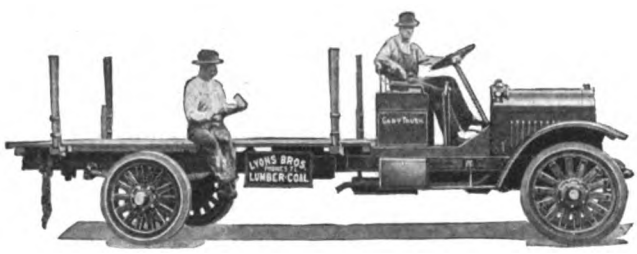
Wire or write for advance information or visit our factory. Handsomely illustrated catalog sent on postal request.

Territorial arrangements now being made for early deliveries

MANLY MOTOR CORPORATION
WAUKEGAN ILLINOIS

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The
Gary Motor Truck Company
Manufacturers of
Gary Worm Drive
MOTOR TRUCKS



5 MODELS *5 CAPACITIES*
¾ Ton 1 Ton 1½ Ton 2 Ton 3 to 3½ Ton

Complete 1917 Catalog will be mailed Promptly on Request

General Offices:
GARY MOTOR TRUCK COMPANY
610 BROADWAY GARY, INDIANA

THE KREBS COMMERCIAL CAR CO. CLYDE, OHIO U.S.A.

Real Value

You get the full value of your money and more when you invest in a KREBS Truck.

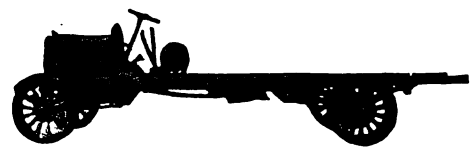
Guaranteed by manufacturers with 16 years' experience in motor vehicle construction, the KREBS combines Simplicity and Low Maintenance with Efficiency and Reliability.

It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault-type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.
KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.
Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.



Wartime Economy

consists chiefly in eliminating all waste without interfering with the normal development of business.

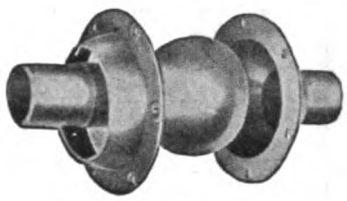
Its application to motor transportation means the haulage of merchandise from one point to another in the quickest possible way at the lowest possible cost.

How this is being done in various branches of service is clearly and concisely told in every issue of the COMMERCIAL VEHICLE.

The subscription price of $2.00 a year is insignificant as compared with the time and money saving helps you can extract from the magazine itself. And if you are already a subscriber to the COMMERCIAL VEHICLE what about recommending it to your friends?

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BOSSERT



In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice. We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, axle housings, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



THE BOSSERT CORPORATION

UTICA, N. Y.

Strength

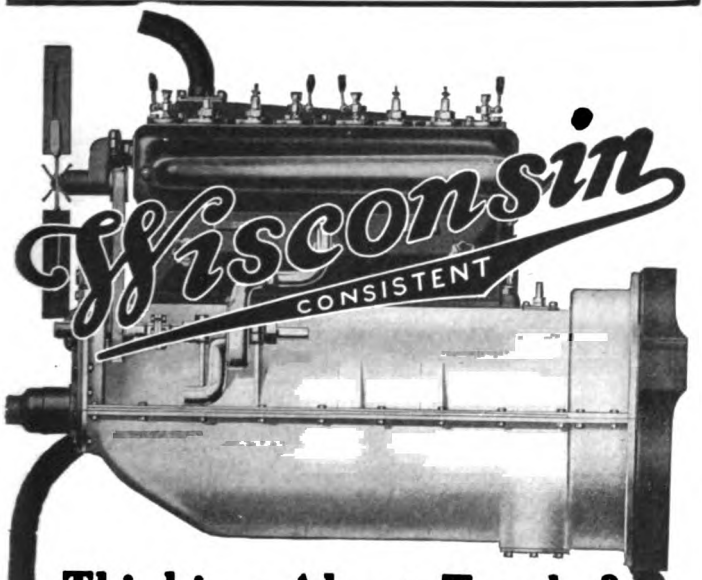
Strength of Gramm-Bernstein motor truck construction has made a multitude of friends among both owners and dealers. Each G-B dealer enjoys a distinct satisfaction and handsome earnings. Each buyer helps the dealer to sell other G-B trucks. And back of the splendid G-B sales organization is 16 years of motor truck pioneering. The G-B sales plan is attracting the country's leading dealers and we want you to investigate it. Write or wire today.

The Gramm-Bernstein Motor Truck Company,

13 Gramm Blvd., Lima, Ohio

GRAMM BERNSTEIN





Thinking About Trucks?

If you are, you're thinking about motors—wondering which one will stand up best under the tests your work will put it to. Men who know motors will tell you there's dependable quality in Wisconsin Consistent Motors that keeps them on the job, working at full efficiency.

Motors for pleasure cars, trucks and tractors. Write for specifications.

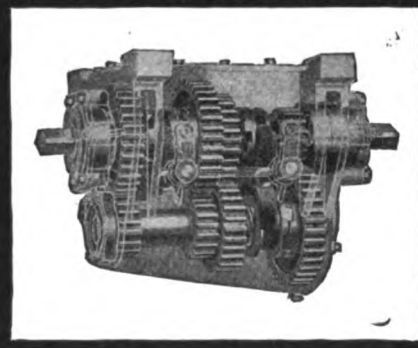
Wisconsin Motor Mfg. Co.

Sta. A-Dept. 319 **Milwaukee, Wis.**

New York Branch: 21 Park Row, T. M. Fenner, Factory Representative.

Pacific Coast Distributors: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles Co., Los Angeles, Cal.

COTTA TRANSMISSIONS



All Gears Always in Mesh

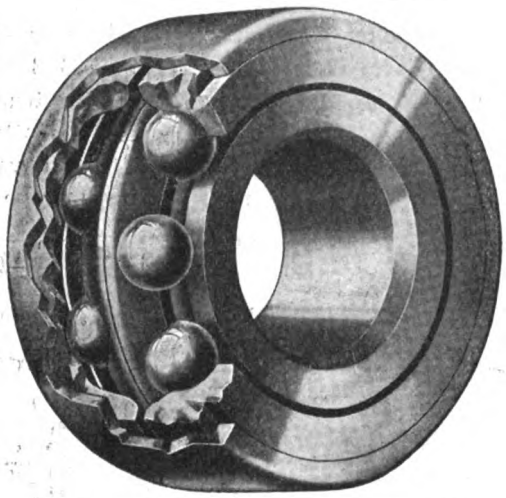
An Assurance of Dependable Service

The Cotta Transmission Co.

Rockford, Ill.

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First— Foremost— Fittest—



The unprecedented success of the New Departure Double Row ball bearing is evinced by the effort of other manufacturers to approximate its design and efficiency.

The idea of combining in a single self-contained unit the ability to resist all thrusts and radial loads has been accepted because of its practicability and economy.

The practice of mounting three separate bearings together to resist these same combined thrusts and radial loads is fast being superseded everywhere by the more simple, economical, satisfactory, easily installed New Departure Double Row.

As pioneer in this field the New Departure has important patented features which place it in advance of any anti-friction bearing yet produced.

Write for the "Brown Book"

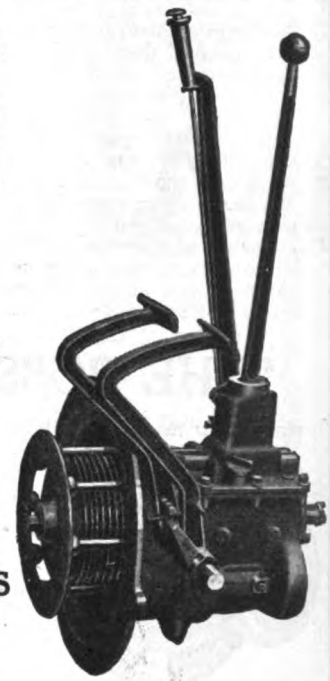
THE NEW DEPARTURE MFG. CO.
Bristol, Conn. 818-20 Ford Building, Detroit.

NEW DEPARTURE BALL BEARINGS

FULLER
Unit Power TRANSMISSIONS

Look for the name FULLER on your transmission

It stands for the best that can be built



Eastern Representatives
EARLE & BOGGS
1790 Broadway, N. Y. C.

FULLER & SONS MFG. CO.
Kalamazoo, Mich.

Standard
MADE IN DETROIT USA

Motor Trucks

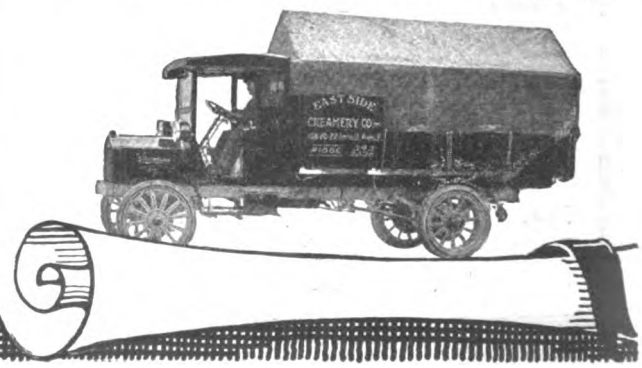
Startled the Motor Truck Industry By a Unique Sales Plan

First of all, the Standard is an unusual truck. It is a powerful combination of many of the best-known units manufactured — parts that are considered the standard the world over.

The Standard Motor Truck is sold in an unusual way. Costs you nothing to learn of the Standard Selling Plan. It is the most liberal ever made.

Write for details of this plan. No obligation.

Standard Motor Truck Co. 315-327 Bellevue Ave. Detroit, Mich.



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UNIVERSAL SERVICE

The countless threads of Universal Telephone Service are closely woven into the fabric of the nation's commercial and social life. The Associated Bell Telephone Companies in their stupendous task of building and maintaining the nation's telephone service use a fleet of 151

Mack TRUCKS

They have made good—are making good for the telephone companies. They will make good for you.

International Motor Company
64th Street and West End Avenue
New York City

BROWN-LIPE

transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

BROWN-LIPE GEAR CO.
SYRACUSE, N. Y., U. S. A.
BROWN-LIPE CHAPIN CO.
Differentials Transmissions

NEW YORK—Thos. J. Wetzel, 29 West 42d St.
SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C

POLACK TYRES

"The Highest Priced Tires in America"

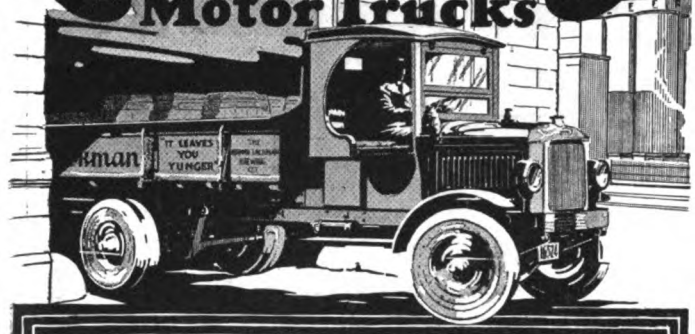
Polack Tires are vulcanized under **1000 tons pressure** by the most powerful press in America. This method, plus a liberal amount of pure rubber, proper curing, the correct size and shape for every need, makes Polacks the easiest riding, the longest lived and the lowest in **cost per mile.**

Polack Tyre & Rubber Co.
1876 Broadway NEW YORK CITY
Branches and Service Stations in All Principal Cities

10,000 Miles Guarantee Invariably Exceeded

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ARMLEDER
Motor Trucks



IN NEW TERRITORY ARMLEDER SALES ARE SURPRISING

How does a truck sell in a new territory where it has never been before?

That is a real test of its saleability—of its value as a business builder for dealers.

Armleders have a remarkable record for quick progress under such circumstances.

In Philadelphia, in Bridgeport, in Cleveland—virgin fields until a few months ago—Armleder sales built profitable businesses for new dealers from the start.

Some of the dealers had never sold trucks before. Now they are dropping their other lines to concentrate on Armleder sales.

You can do as well. Perhaps better.

If Armleders are not sold in your town write for the facts.

Two-Ton
Worm-Drive
Three-and-a-half-Ton

The O. Armleder Co.

TWELFTH, PLUM & CHARLES STS.
CINCINNATI, O.

SERVICE

"The Steering Gears that Predominate on Motor Trucks"

Enormous bearing surfaces, highest quality materials and careful workmanship guarantee the safety, reliability and easy operation of

ROSS GEARS

Our fire-proof, day-light plant, modern, specially designed machinery, and unequaled facilities for securing raw materials, are assurance of SERVICE in deliveries.

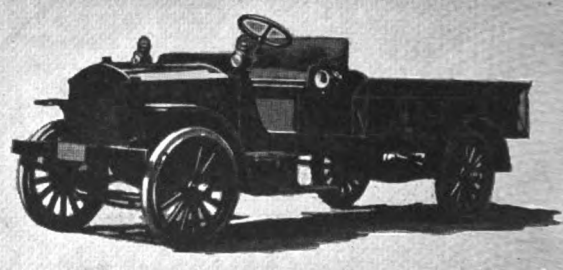
On quality and service, Ross Gears are now in use on 124 different makes of motor trucks.

Write for catalog

ROSS GEAR & TOOL CO.
750 Heath Street Lafayette, Ind.



The GLOBE Truck
The Motor Truck PLUS



Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

Globe Motor Truck Co.
721 Wright Bldg. St. Louis, Mo.

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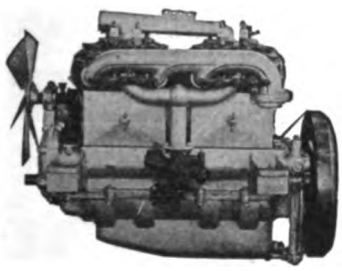
GMC
GENERAL MOTORS COMPANY
TRUCKS

This trade mark stands for a complete line of trucks *built in worm and chain drive* to meet the varied demands of city and country work—a truck to fit your business.

Send for catalogues today

GENERAL MOTORS TRUCK COMPANY
One of the Units of General Motors Co.
Pontiac, Michigan

Branches and Distributors in principal cities (84)



Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications

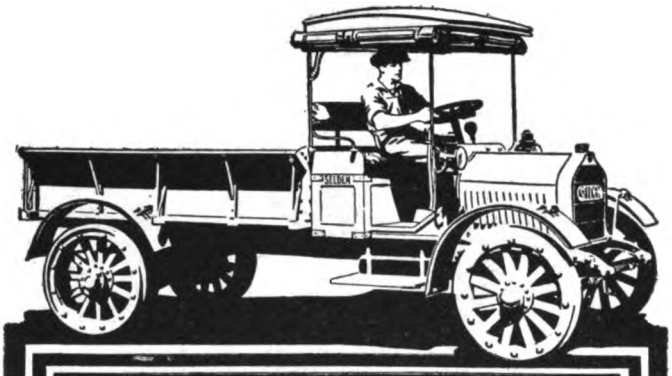
BEAVER MFG. COMPANY
Milwaukee Wisconsin

THE MARK OF A BETTER RADIATOR

G & O
Radiators
for
Heavy
Duty
Service

The G & O Mfg. Co.
New Haven Connecticut

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"I Could Have *Sold* Selden Trucks on the Performance of Mine"

writes a Hardware and Furniture Dealer in Silver City, New Mexico. "Four years ago we purchased a One Ton Selden Truck, and although it has been in constant use every working day since, it has never given us any trouble. And a truck must be made sturdy for this country. I could have *sold*

SELDEN TRUCKS

on the reputation of my One Ton."

We are continually receiving reports such as this—which prove Selden Trucks worthy of their name—"IN-BUILT QUALITY" Trucks.

There's a Selden Truck of ¾ Ton, 1 Ton, 2 Ton, 3½ Ton or 5 Ton capacity that is especially adapted to **your** business—that will make it profitable for you to haul by motor truck. Ask us for specific information on motor haulage in your line of business.

Dealers: It is possible that we may not have a representative in your community. Perhaps you can qualify. Write for our Dealer Proposition. If you can get a Selden Agency it will mean success in the truck business for you—for Selden Trucks are going in a big way—quick.

Selden Truck Sales Co.
Rochester, N. Y. U. S. A.

SELDEN TRUCKS · SELDEN · IN-BUILT QUALITY

MACCAR

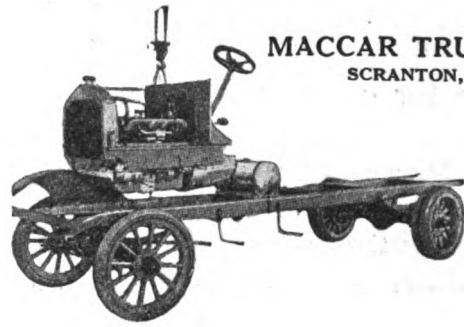
Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.

If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.

The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.

Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.



MACCAR TRUCK CO.
SCRANTON, PA.

Heavy Duty Truck Frames

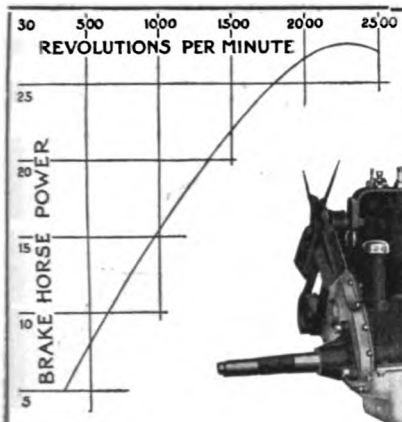
Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

Added capacities together with latest type equipment enable our assuring you of satisfactory service.

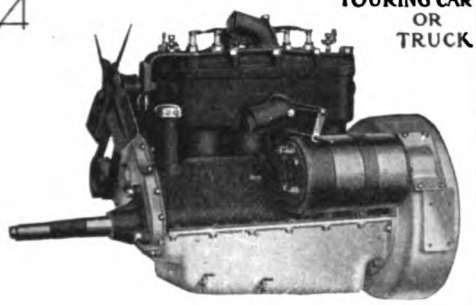
Our engineers are at your service, and we solicit your inquiries.

Driggs-Seabury Ordnance Co.
Sharon, Penna.

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LE ROI MOTOR
3⅛×4½ MODEL C
FOR THE LIGHT ROADSTER
TOURING CAR
OR
TRUCK



Used by leading manufacturers of best-known American-made light trucks.
The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

CABLE LE ROI MILWAUKEE

STEGEMAN 6 (SIX CYLINDER) TRUCKS

THE ONLY SIX CYLINDER



THE Stegeman is the only line of Trucks powered with a Six Cylinder Motor. This is the most sweeping development in the Truck Industry. A year's continuous tests have demonstrated the Stegeman Six Cylinder undisputed Master of the Truck situation—both as to economy and endurance.

Agencies Go Quickly

Because Stegeman Six Cylinder trucks with electric starter furnish a string of argument that clinch sales and back competition clean off the board.

Sizes 2, 3, 4, 5 and 7 Ton

Stegeman Motor Car Co. Milwaukee



International Motor Trucks Sold on a Business Basis

A MOTOR truck must either make a dollars and cents saving that will justify a business man in buying it, or it must bring him more business and greater profits. We offer the **International Motor Truck** on that basis.

The models for 1917 were designed to satisfy experienced truck users. That is why the **International** is different from every other truck —why the radiator is behind the engine—why the engine is so easy to get at—why it is built from motor to body in one factory—why we feel that we can recommend it without reserve to every business man.

Every experienced truck owner, for instance, wants a shaft drive rear axle, but he wants it with chain drive strength and lightness. A combination of the two types gives truck owners the best of all rear axle service—an axle consisting of two members, a single piece forging to carry the load and a live axle for transmitting the power. This combination gives the quietness and neatness of the shaft drive with the strength of the chain drive axle—just what experienced buyers want. When you make your decision on a motor truck, you cannot get too much information on this **International Motor Truck** feature.

One of these sizes will meet your requirements: Model H chassis, 1500 lbs. capacity, $1225; Model F chassis, 2000 lbs. capacity, 128″ wheelbase, $1500; Model F chassis, 146″ wheelbase, $1550. Prices cash f.o.b. factory. (Prices subject to change without notice.) Write us for convincing folders that make every point clear.

International Harvester Company of America (Incorporated)

88 Harvester Building Chicago U S A

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A MARK of distinction symbolizing super-quality, strength and endurance in truck tires that are making history.

Buy Indians and insure the utmost returns from your truck tire investment.

INDIAN TIRE & RUBBER CO.

NEW BRUNSWICK NEW JERSEY

AGENTS WANTED



"Little Giant" in the service of the Inland Steel Company

Owing to territorial adjustments we now have several money making territories open to live agents. If you want to connect with a progressive motor truck manufacturer who backs his guarantee with $12,000,000.00 capital, who has had twenty-five years manufacturing experience and who has 25,000 satisfied customers in the United States

Here is Your Opportunity.

The "Little Giant" Line Includes

Little Giant Convert-a-Car. (Converts any Ford into a one ton truck)
Model 15—1 Ton Worm Drive
Model 10—2 Ton Worm Drive
Model 17—3½ Ton Worm Drive

SPECIAL BODIES FOR EVERY PURPOSE

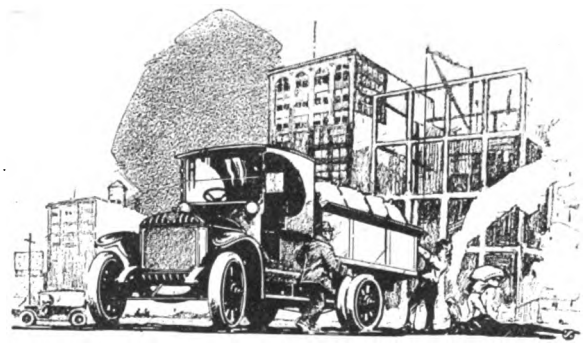
Write for Prices, Specifications and Terms

CHICAGO PNEUMATIC TOOL CO.

615 Little Giant Building CHICAGO

Branches and Service Stations Everywhere

DIAMOND "T"



A Truck That Has PROVED Its Merit

Under the severest tests, with the hardest usage, even abuse, Diamond T Trucks have demonstrated beyond question their high quality construction, their absolute dependability and matchless fuel economy.

Ask any Diamond T user, for Diamond T rests its case with them. Write us today for complete information.

DIAMOND T MOTOR CAR COMPANY
Chicago, Ill.

5 MODELS
All Worm Driven

1 Ton, 1½ Ton, 2 Ton, 3½ Ton, 5 Ton Capacity

PIERCE Governors



Guarantee Motor Truck Efficiency

Owners of motor trucks are learning from experience that the only proper way to judge any truck is to take into consideration cost of upkeep, cost of operation, and performance—three features which are vitally dependent upon the governor. A thoroughly reliable governor will eliminate 75% of the usual repairs, reduce consumption of gas and oil, and keep the truck always ready to do the owner's bidding.

One Truck on the Job Is Worth Ten in the Repair Shop

The Pierce Governor, through its automatic and perfect control of the motor, prevents the troubles that put trucks in the repair shop. Supplies just the right amount of vapor to the motor, permitting the driver to get full power at all speeds up to the danger point, and shuts off the power when that point has been reached.

Can be adjusted for any desired speed.

Used by 57 Prominent Truck Manufacturers
Demand a Pierce Governor on the truck you buy

PIERCE GOVERNOR COMPANY

World's Largest Governor Builders.

ANDERSON, INDIANA, U.S.A.

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The

Mead-Morrison

Patent Truck Winch

will sell trucks to general trucking firms, electric light and power companies, piano and furniture movers, hay and grain dealers, and contractors, who use it not only for hauling heavy machinery up on the truck body, but also for hauling the truck itself out of mudholes and ditches.

The installation of the Mead-Morrison patent truck winch is extremely simple and its use cuts loading and hoisting costs to a minimum.

Capacity, single line 3500 lbs. at rope speed of 60 feet per minute. Space required, 22 inches square. Fitted with automatic brake, making it SAFE AT ALL TIMES. Write for particulars.

Mead-Morrison Mfg. Co.
East Boston Massachusetts

SPEDOLENE

The Lubricant That Kills Heat

For Every SERVICE

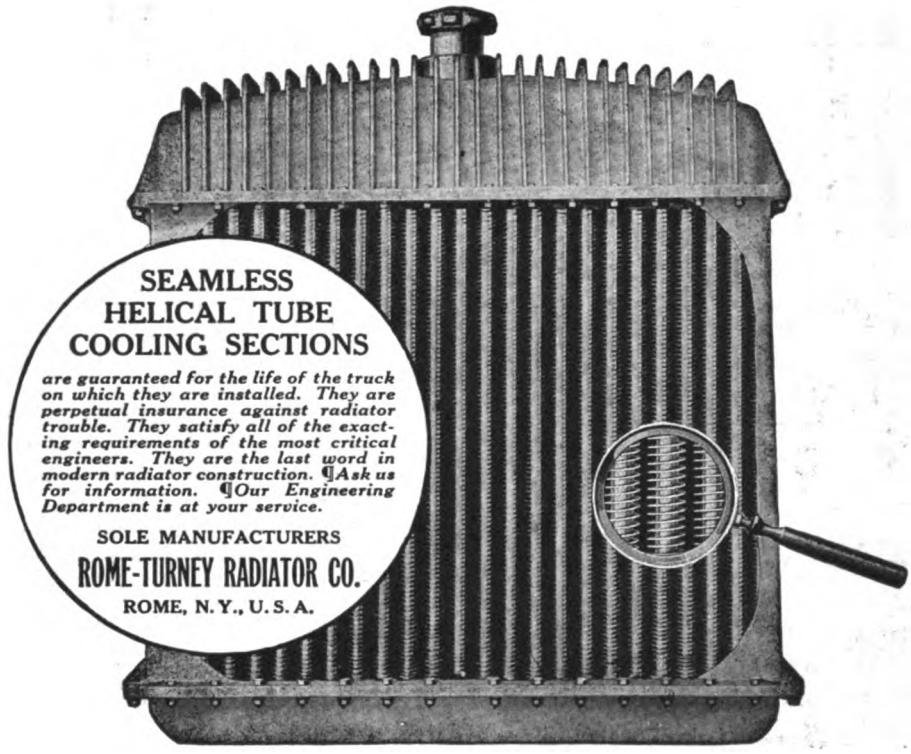
Spedolene is used on this Knox-Martin tractor.



Distributors: New York City, Brooklyn and Long Island, N. Y., are open for Spedolene representation. Interested distributors are urged to write for particulars.

C. A. C. LUBRICANTS Co.
7-11 Summer Street Worcester, Mass.

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SEAMLESS HELICAL TUBE COOLING SECTIONS

are guaranteed for the life of the truck on which they are installed. They are perpetual insurance against radiator trouble. They satisfy all of the exacting requirements of the most critical engineers. They are the last word in modern radiator construction. ¶Ask us for information. ¶Our Engineering Department is at your service.

SOLE MANUFACTURERS

ROME-TURNEY RADIATOR CO.

ROME, N. Y., U. S. A.

Cut your delivery costs

Fleet of 19 Packard Trucks Equipped With Our Recording Instruments



The Dreadnaught Indestructible Hub Odometer keeps an accurate daily mileage record. Enables you to know exactly the life in miles of each and how much your gasoline, oil, repairs and maintenance cost per mile.

DREADNAUGHT *Indestructible* Hub Odometer

—is guaranteed indestructible.
—replaced **free** of charge if broken in collision. Cannot be tampered with. Figures always show right-side up.



A Few Who Use Dreadnaught Hub Odometers

Acme Tea Company, Philadelphia—19 trucks.
New York Telephone Co.—500 trucks.
Gulf Refining Co., Pittsburgh—200 trucks.

AMERICAN TAXIMETER COMPANY

Manufacturers of Jones and Popp Taximeters

1765 Broadway, New York City

Service Stations in New York, San Francisco, New Orleans, Washington, Chicago, Detroit, Boston, Philadelphia, Seattle, St. Louis. Cleveland, Buffalo.

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DUPLEX
THE ORIGINAL
4 WHEEL DRIVE

MEN-AND EXPERIENCE

SOME of the biggest automobile men in the country live in Lansing. Some of the biggest automobile men in Lansing are officers and directors of the Duplex Truck Company, builders of the original four-wheel drive truck.

These men were pioneers in the automobile industry. They have been closely associated with some of the industry's greatest successes.

These men—and their money—are behind the Duplex Truck Company because they have made sure that the Duplex is a superior truck—a super-strength truck that will out-pull, out-perform any two-wheel drive truck made.

PIONEER IN TRUCK FIELD

The Duplex is a pioneer in the truck field. It is the original four-wheel drive truck.

For seven years the Duplex was built in a modest factory in Charlotte, Michigan. Production was small. But wherever Duplex trucks went they did big things. The Duplex out-performed all rivals. Its gasoline mileage was greater, its up-keep cost less, and its tire mileage 30 per cent. greater than rear-wheel drive trucks of similar capacity.

These facts become known to Lansing automobile men—some of them competitors of the Duplex. They investigated the Duplex and so completely were they convinced of the truck's superiorities that they organized a million dollar corporation to take over the Duplex patent rights, business and factory at Charlotte. Here production was at once trebled.

At the same time plans were immediately made for a new factory at Lansing, which is now under construction on a fifteen-acre site. When completed production will again be trebled.

A BIG OPPORTUNITY

To established high-grade dealers, an opportunity is offered to become associated with this million dollar company—to become distributors for a corporation whose financial resources are absolutely unquestionable, and amply adequate, and whose product has been demonstrated to be incomparably superior to any other type or design of truck on the market. In performance under most difficult conditions, and in low haulage cost, the Duplex will show records not heretofore approached.

This is an opportunity of a lifetime to aggressive dealers who are following the trend of development in the motor truck field.

SEND FOR 1917 CATALOG

Our 1917 catalog tells not only about the Duplex Four-Wheel Drive Truck, but about the men who are building it—some of the biggest men in the automobile industry—men with whom some of the country's leading distributors are now associating themselves.

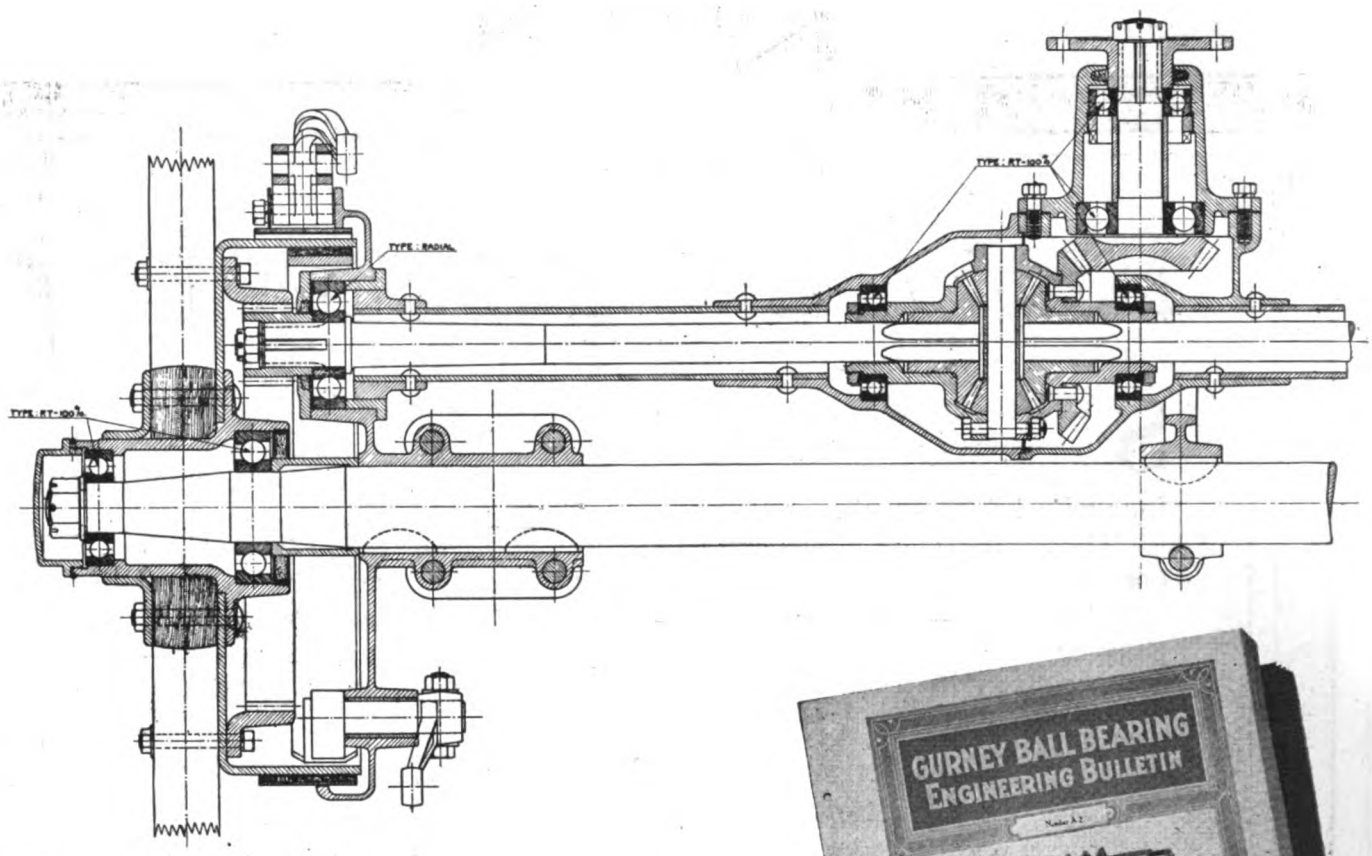
Write or wire today for complete specifications and our dealer proposition.

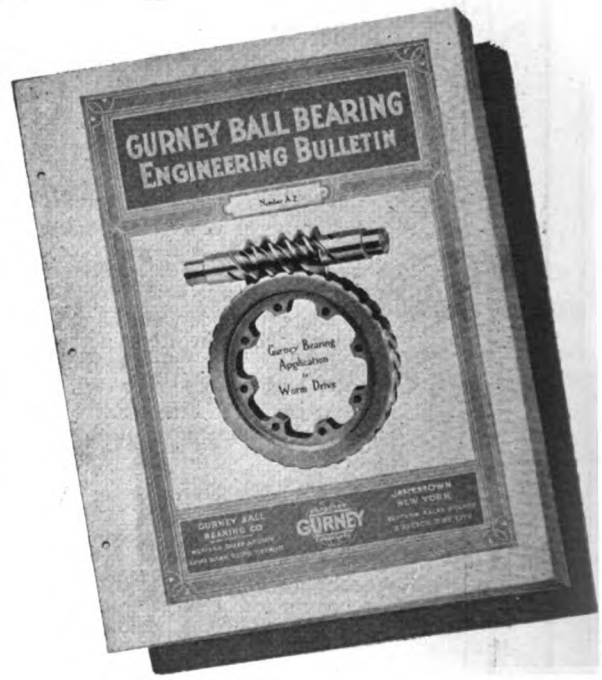
ADDRESS ALL COMMUNICATIONS TO DEPT. 107

DUPLEX TRUCK COMPANY

LANSING MICHIGAN

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How to Apply Gurney Ball Bearings to Internal Gear Drives

If you are interested in the design of internal gear drives, it will be worth your while to look over the layouts in our bulletin A-3, which show the application of Gurney Radial and Radio-Thrust Bearings to four different designs of internal gear drive axles.

In addition to the illustrations and descriptions of these four designs, there are eight pages of diagrams and calculations showing how we figure bearing loads under different conditions.

This bulletin will be sent on request. Write today before you forget it.

GURNEY BALL BEARING COMPANY

Conrad Patent Licensee

Chicago, Ill. **Jamestown, N. Y.** **New York City**

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Traffic Festival News

MAY 15, 1917



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FEDERALS in the Sage Brush Country



These Trucks Have Replaced the Old Stage Coaches On the Jordan Valley Stage Line in Mountains of Idaho and Oregon

THE crack of the whip is heard no more. No longer do the sweating mules strain at the traces of the old stage coach and the driver has ceased to urge his steeds out of the ruts with curses.

Motors have replaced the picturesque Stage Lines in the sparsely settled communities of the western country.

Between Caldwell, Idaho, and Jordan Valley, Oregon, there is some pretty rough country; seventy miles of mountainous desert covered with lava rock and with its only vegetation, the uninteresting sage brush.

The FEDERAL Trucks traverse this route every day except Sunday and this trip is a far different matter from the olden days when animal power was the only method of conveying passengers, mail and express over the route. The road is very hilly and rough and has little care, if any, from one year's end to the other, yet the trucks have cut down the running time by several hours and increased the comfort of travel considerably as well.

Ten miles of this trip in the wet season is in gumbo mud, hub deep. Then comes five miles of loose sand, difficult even in wet weather. Following this there is ten miles of white ash soil, which is very loose and slippery, hub deep and full of chuck holes and high centers, except in the wet season when it is the stickiest of mud.

Join Us in This Mountain Trip

Climb into the side seat of the FEDERAL shown in the picture herewith and come with us on a trip to Jordan Valley.

The first thing you do upon sitting down is to put your feet on the opposite side of the car to brace yourself, because this is not going to be an altogether pleasant ride. You are going to be jolted

Our driver is a very careful one and for the first ten miles he exercises splendid judgment in negotiating the hills, because the gumbo mud often hides a very deep hole and you never know at what moment you are going to be thrown on the lap of the person sitting opposite you. But the driver knows all about it, because he makes the trip so often that every inch of the road is familiar to him. You wonder how much more you will be able to stand at the end of this ten miles.

You have time to recover in the stretch of sand five miles long which comes next because the going here is easier on the passengers although fully as hard on the truck.

You are convinced that the mud at the first of the trip was pleasant in comparison with the next portion of the journey, which is through white ash soil. The rains have washed this fine soil and the travel has worn deep chuck holes in it which are filled with mud and it is much harder riding that at the beginning of the trip.

You have now come twenty-five miles of the journey and before you lies Poison Creek Hill. Acres and acres of rising ground stretch away to the horizon with only the everlasting sage brush to break the monotony. Poison



Starting from Caldwell, Idaho, on 70-Mile Run

Creek Hill is a nine mile climb. The grade runs from 12 to 20 per cent nearly the whole distance with the exception of one stretch which is 25 per cent grade. You wonder whether the truck will be able to climb some of the grades which appear on this long foothill, but the FEDERALS owned by Mr. J. A. Wroten, contractor on this mail line, make this very strenuous trip without trouble or loss of time and you come to the end of the journey with a feeling of wonderment at the superiority of the mechanical equipment over the old tedious, inefficient, animal driven vehicles.

The first FEDERAL to be tried out on this line was sold to Wm. P. Hobson, who was then contractor for carrying the mail between Caldwell and Jordan Valley.

At first Mr. Hobson used the FEDERAL only for the first 40 miles and back each day over the worst of the trip, but by so doing he gained 2½ hours at the other end for the benefit of his team which he used from there on to the end of the trip.

One FEDERAL Eliminates 12 Horses

By the use of this FEDERAL he was able to discontinue twelve head of horses on the forty miles of the trip.

He always had the truck loaded to capacity in freight and carried an average of five passengers per day.

This was the first truck of any kind to go over this road and it went through snow and mud all winter until May 1915, when Mr. Hobson's contract was finished and he put his truck into the employment of the Bell Telephone Company, where it has been ever since, building new telephone lines through the valleys and mountains of Idaho and Utah.

The success of this FEDERAL on this trip, induced the new contractor who succeeded Mr. Hobson, Mr. J. A. Wroten, to purchase two FEDERALS and place them on this stage line, as by so doing he could eliminate horses entirely. So he purchased two Model "M's", 1½-ton, and runs one each way every day except Sunday.

No one can watch the steady accomplishment of these trucks on this arduous trip without being convinced of the power and stamina of FEDERAL Trucks. The pictures accompanying this story are interesting because they show the nature of the country, its wildness and uninteresting desolateness. In one picture the FEDERAL is shown on a 25 per cent grade on Poison Creek Hill, spoken of elsewhere.

At the time this picture was taken this FEDERAL was loaded with 3,200 pounds of mail and parcel post, and five passengers the photographer being the sixth passenger.

The other picture shows the two FEDERALS now covering the route, meeting at the halfway point.

The pictures were taken by Mr. S. H. Grimmett and he also has very kindly supplied us with the information regarding the work of the FEDERALS there.



See the Jordan Valley in the Distance—We are now on Poison Creek Hill

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FEDERAL MOTOR TRUCK COMPANY

FEDERAL
MOTOR TRUCKS

DETROIT MICHIGAN U.S.A. May 1, 1917.

M. L. Pulcher

Federal Motor Truck Company,
Newark, N. J.

Attention: Mr. George Ludlum.

Dear George:

Everything comes to him who waits. You've been looking forward to the complete FEDERAL line. Now it's ready - FEDERAL quality in every needed capacity.

We are going to make announcement of all five models in May - One Ton, One and a Half Ton, Two, Three and a Half, and Five Ton models.

The photo prints I enclose will give you a good idea of the jobs themselves. I think they're corkers. How do they look to you?

Remember — these are not "new" models in the sense of being revolutionary departures from past FEDERALS. All the stamina and reliability of the good old FEDERAL has gone into these models -

- in addition, they have everything that motor truck experience has taught us right down to May 1st, 1917.

This line of FEDERAL trucks is, in essence, the outgrowth of seven years spent in studying the haulage needs of Business.

Features? Every point of FEDERAL construction is a "feature" in the sense that it was designed solely with haulage service in mind.

The engine is a truck engine exclusively — "full of pep". The oiling system, by means of pump pressure, increases lubrication as heavy duty or increased speed make it necessary - and so on -

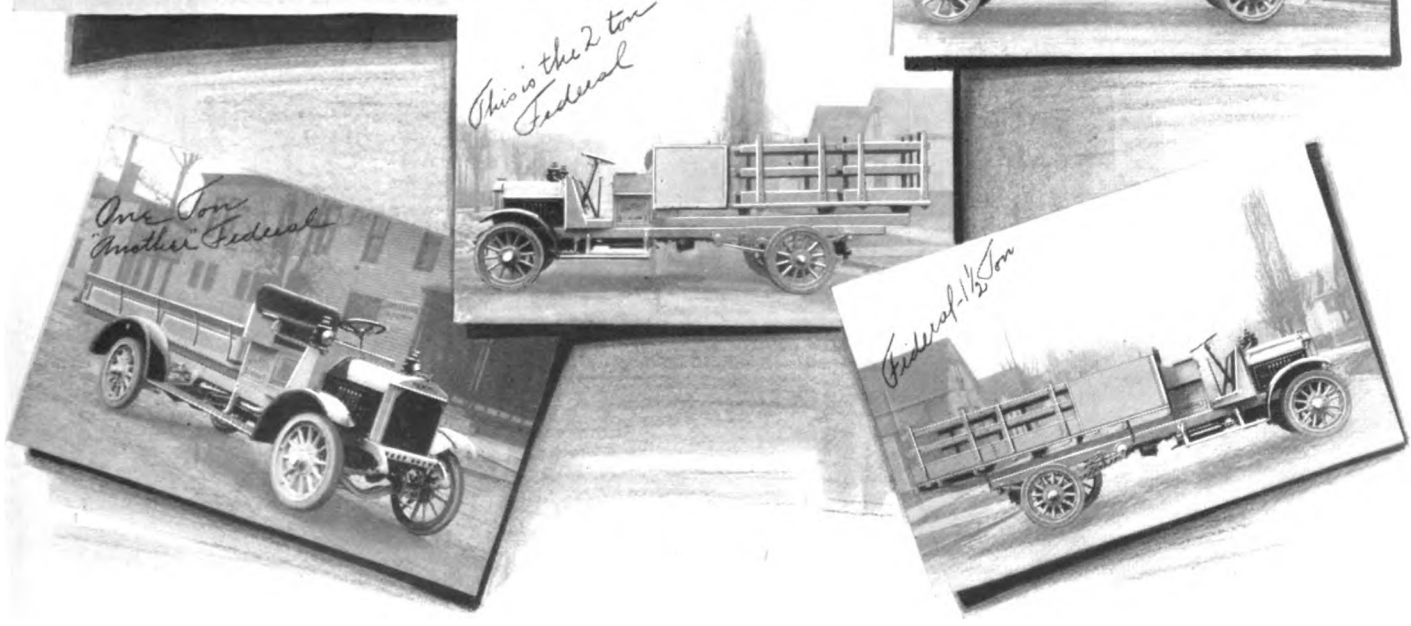
I can't hope to cover all the points here, of course. You have them all in the "Blue Print Book". We are receiving quite a number of inquiries for these. Do not fail to get a supply for distribution.

Now then, here's hoping for the best year yet! I know that this FEDERAL family is going to prove well worthy of its name.

Yours with best wishes,
M. L. Pulcher
Vice President
FEDERAL MOTOR TRUCK COMPANY

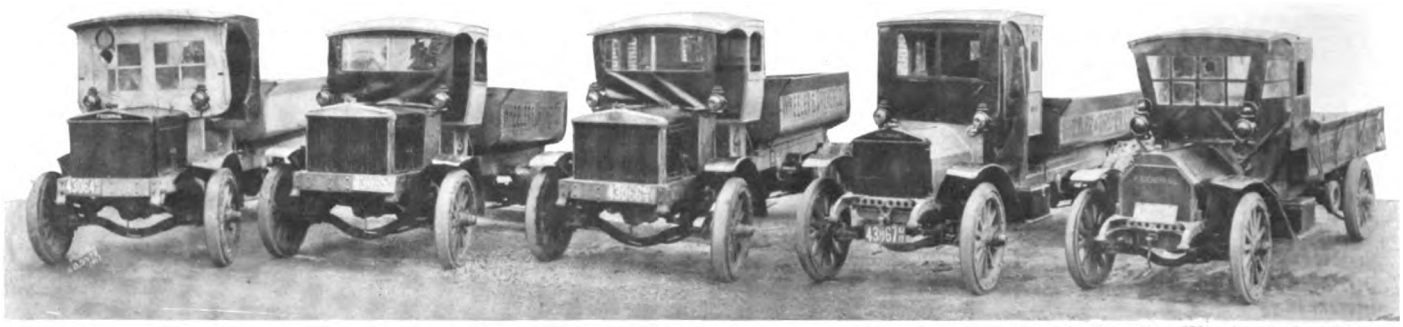






Rather an unusual way to announce a Complete New Line of Models—but when so important a bit of news is to be given to the public it is most fitting that it come from the FEDERAL Founder and General Manager, M. L. Pulcher. The public is invited to read the information which he has given FEDERAL dealers. This appears in over 60 magazines this month.

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Atlantic City—The Wheeler Dreher Co., Fleet

Contracting of All Kinds Booms in the Spring

When Business Begins With the Better Weather Then Do Tons and Tons of Materials Have to Be Removed—Work Must Be Speeded Up—Gangs Kept Supplied

SOME forms of contracting are year around jobs.

Supplying coal and materials to manufacturing concerns, hauling goods to mercantile houses, distributing commodities to retail firms, supplying factories with raw material, and like jobs are those which necessitate year around attention.

When spring opens, however, then comes road building, big contracting jobs, excavating, paving, hauling, and other big things which require speedy and schedule service.

No man is confronted with greater demand for precise co-operation than the contractor.

Therefore the delivery equipment which the contractor uses must be that upon which he can positively depend at all times.

That is the reason why so many contractors stand by the FEDERAL. It has helped them to make good on the big jobs and the little ones. We could write for hours yet we could not convey these facts as well as owners of FEDERALS.

Therefore we are going to let them tell you what FEDERALS have done for them in the contracting business. For instance, M. J. Walsh & Sons, of Holyoke, Mass., writing on January 27th, have this to say about their experience:

Our FEDERAL Spells Efficiency

"An owner of a motor truck is often confronted with many queries relative to a machine, which might be condensed into the few words: 'What is the efficiency of your truck?'

"Many of these questions come from business men who are contemplating the purchase of one. But from whatever source in which they come our reply is invariably the same, 'We are perfectly satisfied with our FEDERAL trucks.'

"The 1½-ton truck that we bought 3 years ago has just been overhauled for the first time in those years and is running in near perfect shape, with prospects bright for many more years of service.

"We use this truck mostly for hauling lumber. It having a long body enables us to load on 18 ft. timber. This truck during its 3 years' service has at all times been ready for work and never allowed to load under its rated capacity.

"So pleased were we with the 1½-ton truck that a year ago after considering several other makes, finally convinced ourselves that we could make no better choice than by ordering 'Another FEDERAL.' This time it was a 3½-ton truck to which we attached a dump body.

"During the construction of the West Springfield High School, this truck hauled all the building material to job, making five trips a day, each round trip of 16 miles.

"We hardly think this could be excelled by any other make of a truck of the same tonnage, no matter what the price.

"In these days of keen competition, a business man's one aim is to have his customers satisfied. We are pleased to be classed among the Satisfied FEDERAL Owners."



This Chicago Contractor also Purchased "Another" Upon the Performance of his First



"This FEDERAL Convinced Us That We Should Buy Another FEDERAL"—M. J. Walsh & Sons

In Chicago we would direct you to John L. Janisch, of 5301 Ravenswood Avenue, who is a cement contractor and builder. He purchased his first FEDERAL in March 1914 and it has performed so well for him that he purchased "Another" and then makes this statement:

"In my opinion and from personal experience I believe the FEDERAL motor truck is the best truck on the market today, and I would say without hesitation to any prospective purchaser, after a fair trial of the FEDERAL, you will be of the same opinion as myself."

The nature of Mr. Janisch's business is such that very heavy loads are carried and he seldom operates it below its capacity.

In sixteen months, Mr. Janisch's FEDERAL covered 10,000 miles and generally over very rough roads, and yet his expenses for repairs, he says, have been "very small, in fact hardly worth mentioning."

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The FEDERALS in Service of E. T. Gresham, of Norfolk, Va. Go Where the Work is Hardest



Robert Fuerst is a Contractor in Cincinnati, Ohio, and Depends on FEDERALS Always

After sixteen months of operation, Mr. Janisch, when taking an inventory, placed the value of the truck at very nearly its original cost. From the condition of the truck he did not believe it had depreciated to any great extent and he is so confident of FEDERAL'S ability to please him further, that he says he doubts very much whether next year's inventory will see it on the list at much decrease.

Down in Meriden, Conn., C. W. Tryon, uses a FEDERAL in Road Building. His business was started with a 1½-ton FEDERAL. Later they decided this was too small and invested in a 3½-ton Model. This truck certainly is a recommendation for FEDERAL stability. The writer has been on this truck when in service on their jobs and has found them using same over roads on which they did not dare put their teams. This gives perfect satisfaction.

The Fleet at Top of Opposite Page

Wheeler & Dreher Company, of Atlantic City, purchased the first 3½-ton FEDERAL built.

The accompanying picture showing five FEDERALS which they operate is ample evidence that their first FEDERAL has made good for them.

The 3½-ton which they purchased was put on duty from 12 to 24 hours a day and, during the first 14 months of operation, they report to us, they spent less than $40.00 for repairs and equipment, and the truck had run over 14,000 miles at that time.

This kind of result is the reason behind the enthusiasm which Wheeler & Dreher Co. exhibits on every occasion when the FEDERAL is mentioned to them. They are enthusiastic FEDERAL friends.

Still another FEDERAL owner in Connecticut using his trucks for road building and general contracting is Gust Anderson of Deep River. Mr. Anderson has been operating a 1½-ton FEDERAL between four and five years. It gave him such good satisfaction that a little over a year ago he purchased an L-12 3½-ton which is equipped with a road oiling device. It is not unusual to see him going over the hills of Connecticut with a load of oil on the truck and drawing a king-drag to level off the state roads. His repairs have been practically nothing. In fact, it has given him such satisfaction, it warranted him in the past few weeks to purchase an another 3½-ton FEDERAL. His construction work takes him over some of the worst country in this section.

Profit by the experience of others. You cannot afford to go through your business career without making use of this advantage. If FEDERALS make good for other contractors there is no reason why they should not help you.

The FEDERAL Horse Cost Contest

H. W. Myers & Son of Bennington, Vt., Prove by Accurately Kept Horse Costs That a 2-Ton FEDERAL Does 350% More Business Than a One-Horse Team at a Cost of Only 20% More

SINCE opening our Horse Cost Contest, as announced in the November issue of TRAFFIC NEWS, many sets of figures have been received.

By far the greater part of these costs show a surprising lack of understanding on the part of the owner as to what constitutes real "Horse Costs."

In fact but two sets are complete enough to be considered by the judges of this contest. They were submitted by H. W. Myers & Son, Inc., Bennington, Vermont, and R. J. Martin, Trenton, Missouri. Both are FEDERAL owners—operating two-ton FEDERAL No. 10106 and 1½-ton FEDERAL No. 3931 respectively.

Taking all points into consideration we believe the record of H. W. Myers & Son entitles them to the first prize of $25—Mr. R. J. Martin coming in for the second prize of $15.

Myers' Equipment Costs

2 Horses	$450.00
Wagon with box complete	150.00
Sleds with box complete	60.00
Harnesses	75.00
Blankets, 1 year	41.00
Insurance, 1 year	10.92
Depreciation, 20%	147.00
Stable Rental, 1 year	90.00

(Lights and water included, also wagon and sleds storage)

This makes a daily operating cost of $5.60 per day.

Regarding these figures Mr. Wm. H. Myers states:

"The figures are taken from our office Cost Records. We include in these records every expense, however small, that is chargeable to delivery. The comparative sheets that we get out monthly are also given very careful attention. They show us the exact comparison of our single teams with our double teams and our trucks.

"The team costs are on a basis of one month—taking an average of each actual expense item for a period of six months. They are for our most efficient two-horse team but the least expensive to operate.

"Our comparative sheets show us that our FEDERAL two-ton truck, for an average of six months, has actually done 350% more business than any of our double teams on the same grade of work.

"For these same six months it has cost us 20% more to operate our FEDERAL Truck per month than to operate any of our two-horse teams."

R. J. MARTIN, Trenton, Mo.

Express, Transfer and Moving

Cost of Two Teams, Wagons and Harness for Six Months—Including June, July, August, September, October and November 1916.

Mr. Martin says:

"Having put truck in operation in connection with my teams I have been very careful regarding the expense. I am sure I have got my horse operation expense as low as it is possible to operate them.

I buy my feed in large quantities and at the very lowest prices. I have very light water expense as I only use city water in extreme dry weather.

I get my drivers at a very reasonable price, as I give them steady work, never try to crowd them and work only eight hours per day during the winter months."

Here Is Myers' Complete Table of Cost on Two Horses for one Month

Depreciation	6% Interest	Insurance	Stable Rental	Shoeing	Blankets	Feed and Bedding	Repairs on Wagon, Sleds, Harness and Blankets	Misc. Supplies as Chains, Grease, Etc.	Hostler Care Extra	Veterinary Services and Tonics	Driver and Helper Compensation	Total Cost of Operation
$12.25	$4.38	$0.91	$7.50	$4.50	$3.42	$31.92	$3.95	$0.55	$4.00	$0.75	104.00	178.13

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FEDERAL Traffic News

Published in the interest of
ECONOMICAL TRANSPORTATION
by the
FEDERAL
MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

Edited by: L. B. DUDLEY : Advertising Manager

EDITORIAL

Trucks Will Lighten Farmers Task

WE would venture the statement that trucks will be more than ever a necessity on the farm this year.

Labor conditions have become so acute that farmers must make each operation efficient.

Time was not long ago when horses were cheap and men could be found to drive them—now horses are high—feed is out of sight—and men are scarce.

Heretofore a number of teams could be utilized and their slowness of work could be overlooked—farm work must be speeded up to the minute.

Motor trucks can save a farmer hours of time—move materials more quickly—bring the field near to the markets—and besides do more work with less men than the slower means—horses.

Less system has characterized farm work than any other line of endeavor, yet with the great demand for increased production more interest is going to be taken towards economy and efficiency on the farm.

Intensive efforts will be necessary to raise all that is demanded by the world—tractors will be utilized more extensively. England is beginning the manufacture of small tractors in great quantities to facilitate better crops as she has already made trucks in great quantities—All European countries use machines because men are scarce—

We have not quite reached the extremities of our allies—but who can say that we won't soon.

Our Cover This Month

Typifies the New Season—Nature is Awake—Spring Work Starts

THINGS in the animal and vegetable kingdoms have been dormant for months—nothing has been produced.

Now, with the world to feed, our soil must bring forth abundant harvest and the nation's eyes are focused on the farm.

Blossoms bring fruit, seeds develop into grain—but work must be done—to bring this to pass—

We all have a part in this cycle—let none of us shirk our duty—Let's assist nature to the greatest dividends in history—

Then will our living problems be near solution—prices will be lower, supply will be nearer to the demand and happiness will come to all of us.

Southern Express Fleet Grows at Chattanooga

This Big Public Service Company Finds FEDERALS Reliable in Twenty-Four Hour Service



It Takes Five FEDERALS to Serve Southern Express in This One City

LARGE express companies are consistent users of FEDERAL Trucks. The picture accompanying this shows five of the FEDERALS now in the service of the Southern Express Company at Chattanooga, Tenn.

This company owns many others, but it was very difficult to even get five of them together at one time because they are so busy delivering goods to consignees.

The 3½-ton FEDERAL shown herewith cost over $40,000 to operate one night's run recently.

The truck is two years old but it has had practically four year's use, being run night and day, in the day time for general express collections and at night for transferring between two terminal stations.

One evening a safe containing $46,000 was being transferred from one station to another in this FEDERAL.

Two highwaymen held up the driver at the points of revolvers and looted the safe of $40,900. Therefore this company considers that this truck was very expensive to operate, for that one night at least. At other times it has proven extremely economical.

It has on the original set of tires. It shows over 14,000 miles in two years by the hub-odometer and they look good enough for at least 1500 to 2000 miles more.

Considering the hard and constant usage to which this truck has been subjected since being placed in commission, it is very remarkable that the entire cost of repair parts, cylinders, grinding valves, has not exceeded $30.00.

These trucks were sold by R. H. Hart, FEDERAL distributor at Chattanooga, Tenn.



Cost Over $40,000 to Operate this Truck One Night

Preparedness and the FEDERAL

LET us be prepared—The FEDERAL has done it's best—anticipating the demand for fast, sturdy trucks to stand up under stringent road and load conditions. We have produced one of the sturdiest one-ton trucks ever manufactured in this or foreign countries, seemingly for this very emergency.

This one ton FEDERAL is going to help sow seed—raise crops—and deliver them to markets. In other words FEDERAL is being mobilized for the nation. Our manufacturing capacity is going to help feed the world—and we are glad.

The other units 1½ and 2 Ton, 3½ and 5 Ton, models, will help to supply manufacturers with materials—keep the business of the world moving—so that when peace comes—this Company will feel that its work has been well done and that the world is better as a result of its efforts.

Why the Army Uses Trucks

A DAILY paper states in a headline "40,000 Motor Trucks Sought—Army of 1,000,000 will need that number is belief of War Department."

There is no mention of the army needing mule trains—those days have passed—and there is no going back to inefficient haulage of army supplies.

The government experts have seen the work of the trucks and recognized their value to efficient mobilization—therefore give no thought to any other means.

Business men the country over are also becoming truckwise. They do not ask as often as they use to, "how can I save money with trucks?"

Now it is "What size truck will best fit my business?" And the FEDERAL is fitted to answer this question.

Indeed in seven years we have learned more about the haulage needs of various lines of business than any other thing.

It is the result of this study that has enabled us to produce a line of models—from one to five tons that fulfills the needs of every line of business.

Our Traffic Engineering Department is continually advising as to the best solution of haulage problems—we have even placed men in the delivery departments of firms to get first hand a line on their requirements.

This department is at your service—it is yours when you need it— write us and give all details of your present delivery and we will advise you as to the best solution of your problems.

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FEDERAL Drivers' Page

"In honestly striving for a creditable performance you dignify your work and your daily accomplishments become a permanent record that can be pointed to with pride"

Trucks Become Important Factor in Lumber Business

W. A. C. Miller Co., Detroit, Know That Their FEDERAL Saves Money and Builds Business For Them—They Train Their Drivers to Efficiency

LUMBER dealers have played an important part in the rapid development of Detroit and one of the foremost companies is the W. A. C. Miller Company.

They early realized the advantages of motor trucks over horse drawn equipment and at the same time they realized that the FEDERAL is more economical and efficient than any other truck.

A Step in Advance

That the Miller Company was wide awake to all opportunities to increase the economy and efficiency of their delivery service was proven when they placed their order with the Thompson Auto Company for a 1½-ton FEDERAL.

FEDERAL No. 3325 was put in service on August 19, 1915. The results have proven their wisdom in making the selection.

Our Daily Service Records appealed to them. On November 3, 1915, Mr. G. H. Kenney submitted the first Daily Service Records in connection with this truck, stating that they commenced the use of this system on October 14th. During the remaining 14½ days in October this truck made 51 trips, delivering 119,400 lbs. and traveling 774 miles, using 128 gallons of gasoline and 60 pints of cylinder oil.

Their Report for the Last Six Months in 1916

Mr. Kenney states: "You will note that we are delivering about $20 worth of lumber for every $1 of cost."

Month	Truck Sales	Feet Delivered	Pay Roll and Expenses	Cost of Delivering per M Feet
July	$6,418.65	185,997	$148.01	$ .79
August	8,034.76	229,944	282.33	1.22
September	5,566.41	144,085	318.19	2.21
October	9,649.10	241,812	312.78	1.29
November	6,881.77	205,510	352.50	1.71
December	6,260.89	180,916	312.76	1.73
		Depreciation	400.00	
TOTAL	$42,811.58	1,188,264	$2,126.57	$1.79

Entirely Satisfied

Once again results proved the wisdom of their choice and on March 29th, 1917, Mr. Kenney wrote:

"Practically every lumber dealer in Detroit is using this system now, but we were one of the first to try it out. We think this is the most efficient device for handling lumber."

The Driver's Part

A good driver is an asset in the delivery system of any business.

When Mr. Carl Leitzau took charge of FEDERAL No. 3325 he found considerable work to be done in order to put it in first class condition. He believes, as every good driver does, that it is better to go over the truck every day and keep it in tune rather than wait till repairs are an absolute necessity. Leitzau says: "I go over the truck regularly and see that things are right. Some men don't figure they are paid to take much interest in keeping their truck in good condition but I think it is my duty."

Such spirit is indeed commendable and the man who considers it his duty to see that things are right will be more valuable to the company and will eventually profit thereby.

Mr. Leitzau's work with this truck, although he is practically a new man with this company, is an evidence of an unusual interest in both the FEDERAL and the W. A. C. Miller Company.



W. A. C. Miller Co. Finds FEDERALS With Trailer Equipment Most Efficient for Lumber Loads

Another Advance is Made

During January, 1916, Mr. Kenney became interested in the removable bodies used by the Burritt Company, in Bridgeport, Connecticut, information concerning which we had furnished him. He wrote on January 17th as follows:

"Possibly we may be able to obtain some new and efficient ideas. We want to be one jump ahead of the rest, therefore, are willing to note any new suggestions which might be of service to us."

They found after considerable investigation that while the removable bodies were good the greatest efficiency was to be found in the use of the tractor and semi-trailer type.

Following up their determination to be "one jump" in advance of the rest, their FEDERAL was overhauled, the stake body removed and a rocking fifth wheel installed on the frame near the rear axle. This was used in connection with two Hercules semi-trailers. This was during the latter part of June 1916, and their truck was the second of this type to be put in service in Detroit.

Six Months' Operation

This comparison of the operations of both types for six months shows the improvement made in the system.

	With Stake Body	With Semi-Trailer
Feet delivered	382,434	1,188,264
Total cost	$1059.35	$2126.57
Cost per M feet	2.77	1.79
Reduction in M-ft. cost	.98	

From July 1, 1916 to January 1, 1917, their horses cost per team on an average $6.80 per day—exclusive of labor charges. The truck averaged $7.37 per day.

A Comparison Between Horses and Truck

However, when comparing the work done by the truck and the team other items must be considered. For instance, during the month of November their records show the following items:

	Truck	Horse
Trips	94	56
Customers	214	93
Miles traveled	1502	354
Customers daily	9	4
Miles per day	57	15
Running speed in miles per hour	7.15	1.64



Carl Leitzau—FEDERAL Driver

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FEDERAL Owners Tell Experiences for May—

Dobbins Brothers, Woburn, Mass.—Farmers

"Must say the FEDERAL we bought from you is working satisfactorily. We use it to haul the vegetables to Boston Market which is about 12 miles. That is principally what we got it for. It can make the trip in 1¼ hours. It used to take 4 hours or over with a pair of horses."

Henry I. Whitwell & Sons, Troy, N. Y.

"I have praised my machine to every person who has asked about the cost of operating and also the working capacity. I also have placed my order for another truck for February 1st."

Geo. F. Bartlett, Groveland, Cal.

No. 3291 hauls supplies, provisions, passengers and express in the Sierra Nevada Mountains for the Hetch-Hetchy Project.

"The truck has been used quite a number of months and has given unusually good satisfaction. It has operated very satisfactorily, part of the winter through some very heavy snow."

L. E. Whitaker, East Longmeadow, Mass.—Coal

"Your letter of July 12th received and contents noted. I have been so busy that I have not kept a record of the work my FEDERAL Truck is doing but we are taking good care of it and it is giving good satisfaction.

"I am not sorry I bought it and the next one I buy will be a FEDERAL."

Hadley Transfer Co., Salt Lake City, Utah—Transfer & Express

"We are covering from 20 to 65 miles per day. Our load runs from 1000 lbs. to 2 tons and I am glad to say that I have not had a minute's trouble so far. We have another truck but so far the FEDERAL has given the best service. We are so pleased with this one that we have just bought another FEDERAL of the 3½ ton size."

Evansville Ice & Storage Co., Evansville, Ind.—Ice

"We are highly pleased with the trucks furnished by you, one of 1½ ton capacity and the other of 3½ tons capacity. They have given us no trouble whatsoever and are highly satisfactory in every way. Before deciding to purchase your truck we received replies from letters addressed by us to a number of the large ice manufacturers in the West."

The Call-em Company, Dayton, Ohio—Transfer.

"We are very much pleased with the FEDERAL truck we are using, and hope that the new one, which arrived Saturday, will prove as satisfactory as the first one.

Mr. O'Donohue of the Dayton Buick Company, is taking good care of us, and we hope will continue to do so."

People's Outfitting Co., Indianapolis, Ind.—Furniture.

"We have not had one minute's trouble and are certainly pleased with our purchase."

A. L. Johnson & Co., Pt. Angeles, Wash.

"We believe this truck—3½ ton FEDERAL No. 5651—to be by far the best truck running."

Aaron King, Claremont, N. H.—Truckman

"Our truck (No. 1797) has run 11,000 miles without a break-down and has given perfect satisfaction in every way."

Leonard Storage Co., Detroit, Mich.—Storage and Moving

"We use a 1½ ton FEDERAL which has been very satisfactory. Gives us good service. We do not overload and have a careful driver. We use a light covered rack body and do most of our country work with this truck. A 1½ ton truck is too light however, and we feel that 2½ tons is best adapted to our business."

Union Mill Co., Springfield, Ill.—Milling

"Our truck has proved satisfactory in every way. We only use it in heavy hauling and sometimes overloaded it in times of necessity. Upon several occasions we were late in our shipping orders and had to load it heavy. We have frequently hauled 50 2-bushel sacks of potatoes, but it worked just like clock work and stood the strain without any difficulty, and it is only a 1½ ton truck."



Long Distance Hauling by Motor Truck

DISTANCE is largely a matter of locality.

In the western states distance does not mean as much as it does to those in closely populated sections.

In the southwest the farmers think nothing of hauling produce and getting supplies from railroads 50, 75 and 100 miles distant.

It does not follow necessarily that the farther west you go the greater distances are, but J. B. Martin of Caliente, Cal., does not regard distance as anything to worry about.

He owns a 1½ ton Federal, and in his work for the Pacific Light & Power Company, Mr. Martin makes an 80-mile trip every day hauling cement, taking heavy loads from Caliente to Isabella, forty miles and return.

He says, "My FEDERAL is standing up as well as ever and working every day. I have hauled against men with other makes of trucks, and they could not carry their capacity load over this trip, and one poor fellow found that it took him a day and a half to make the trip.

"There is no use getting around it, the FEDERAL gets there and back for me, and does it every day."

Edward Friday, Galice, Oregon—General Hauling

"I feel that I have as good a truck as anybody has. I don't think there is any truck built that runs any better than the one that I have."

Thompson-Ritchie Grocer Co., Alexandria, La.—Wholesale Grocers

"Our truck reached us promptly and we have been using it since the day it was received, which was in November. So far it has given us no trouble whatever."

J. & K. Auto Delivery, Inc., New York—Transfer.

"I wish to state to you, as foreman of the delivery department of my firm, that our FEDERAL TRUCKS have stood up more prominent than any of our motor equipment.

I also wish to state that in the long run it is cheaper to operate than our 1-ton—— and horse-drawn vehicles."

Dighton, Mass.—A. Ellery Briggs, Chief.—Fire Department

In reply to yours of 6th inst. would say:—The "FEDERAL" that we have is giving perfect satisfaction, easily making twenty-five to thirty miles per hour on the level, and is a great hill climber. In the section of the town where it is located, are some bad hills and long runs, so we have given it quite a severe test.

City Service Co., El Paso, Texas—Transfer

"After giving our 2-ton FEDERAL TRUCK every test of service, we think so well of its performance and satisfaction which it has given us, you may enter our order for one 3½-ton FEDERAL TRUCK; and, if our business continues to grow at the rapid rate which it is now growing, you may expect repeated orders at a very early date.

"We realize that our business is built on the fact that we are able to give efficient service to our customers, and we have found that Federal equipment is always on the job."

C. M. Dorsett, Ravalli, Montana—Transfer

"I am glad to know that you take such interest in your trucks and they are deserving of it. I am satisfied with the trucks. I have two of your trucks, one two ton and one one and a half ton and they are certainly all right and I am proud of them and can recommend them to any one in any respect."

Crowley, Milner & Co.—Dept. Store

We are pleased to advise you that our Federal trucks have given us excellent satisfaction and the fact that we recently placed an order with you for another Federal is an indication of our good opinion of your trucks.

C. H. Plumb—Florist

This truck has been in our service four years. We have had only one set of tires.

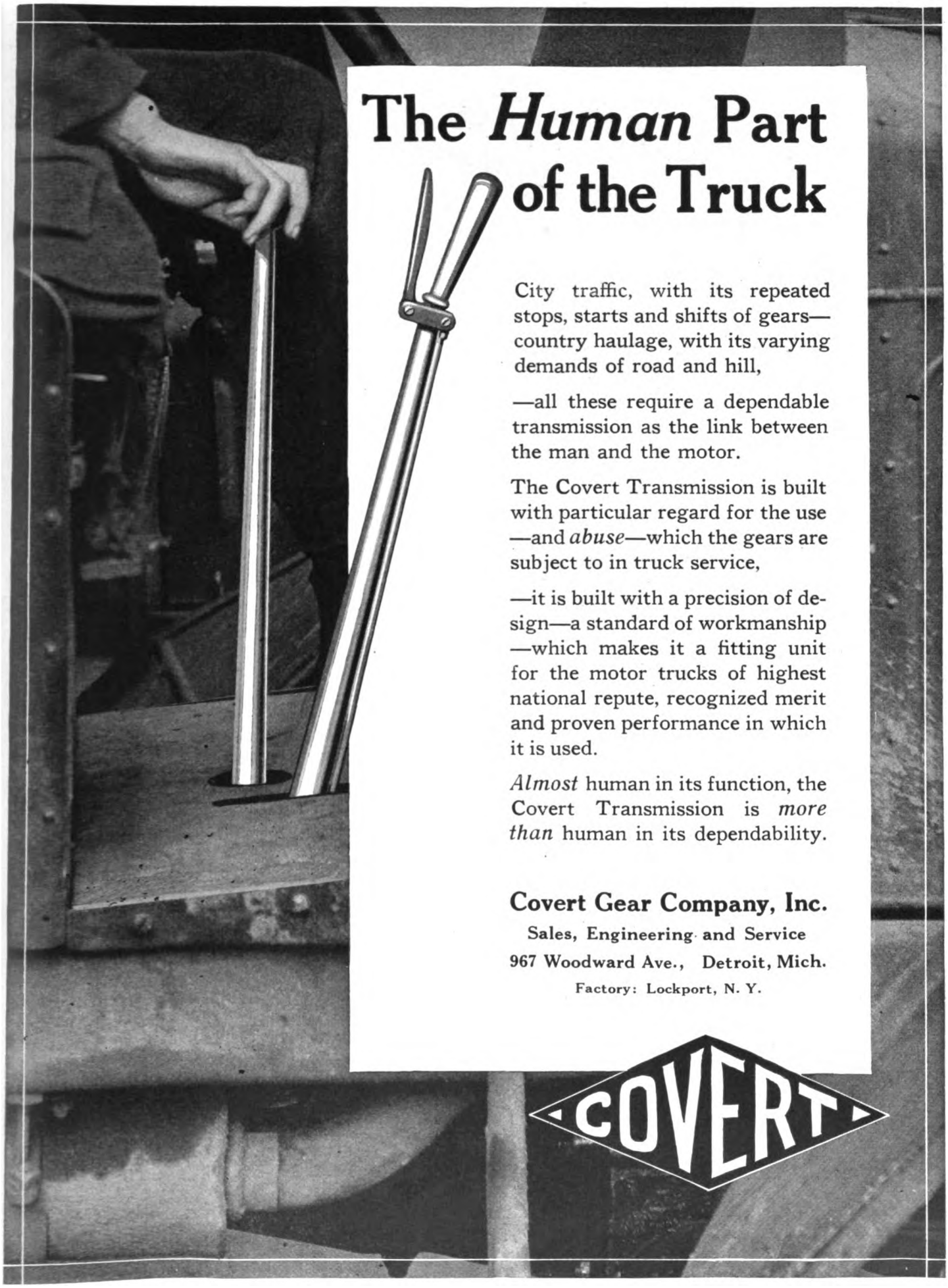
Each round trip covers 8 miles and carries $30 worth of stock each load, making 7 trips a day.

The up-keep of the Federal was so small that we forgot all the horses that we ever owned.

Wm. J. Kuhurtz—Cartage

It is only through the wonderful endurance of my Federals and through the excellent service given by the Thompson Auto Company that I am able to give my customers equally excellent service. I hope soon to add another Federal to my fleet.

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The *Human* Part of the Truck

City traffic, with its repeated stops, starts and shifts of gears—country haulage, with its varying demands of road and hill,

—all these require a dependable transmission as the link between the man and the motor.

The Covert Transmission is built with particular regard for the use —and *abuse*—which the gears are subject to in truck service,

—it is built with a precision of design—a standard of workmanship —which makes it a fitting unit for the motor trucks of highest national repute, recognized merit and proven performance in which it is used.

Almost human in its function, the Covert Transmission is *more than* human in its dependability.

Covert Gear Company, Inc.

Sales, Engineering and Service

967 Woodward Ave., Detroit, Mich.

Factory: Lockport, N. Y.

COVERT

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

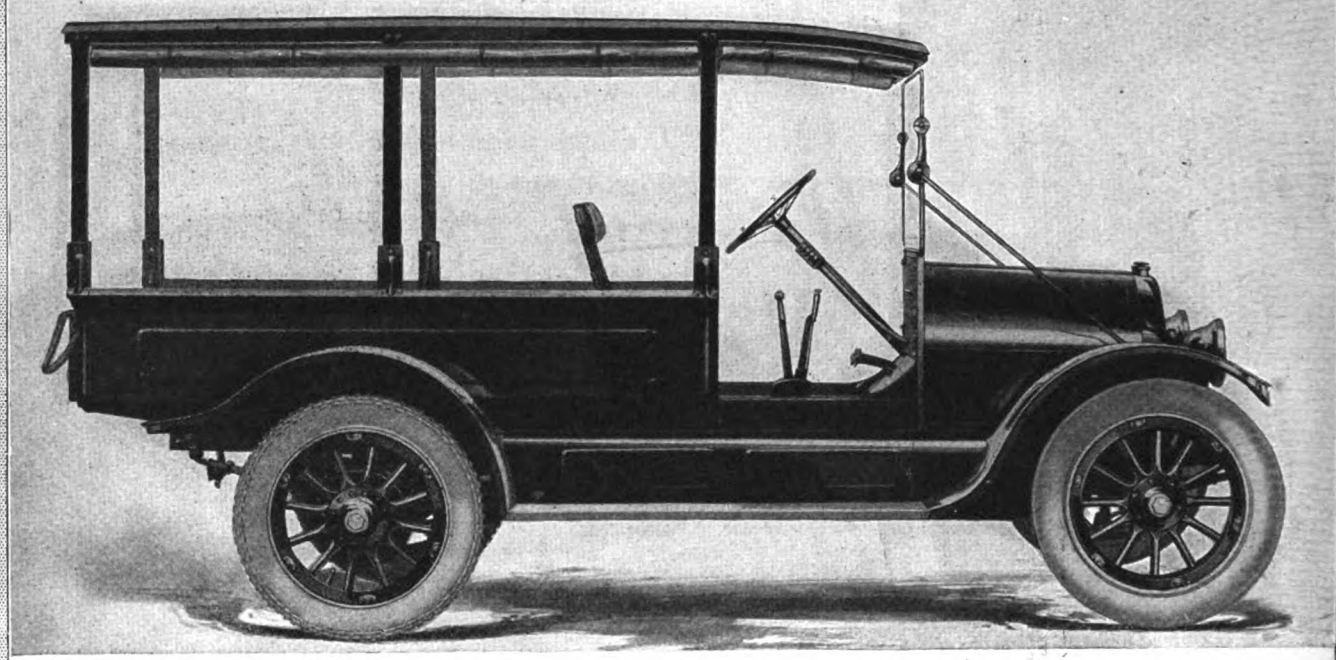
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Overland

TRADE MARK REG.

1200 lb.
Delivery Wagon
Express Type
$850

Chassis $800
f. o. b. Toledo
Prices subject to change without notice



Overlands Save Time and Money

G.S.C. GUARANTY PLAN

Buy it on Guaranty Time Payments

Check up the successful merchants in your town. You will find that practically every one of them has discarded his horse and wagon delivery outfit for the more up-to-date, time and money saving motor wagon service.

Why? Because the horse was a losing proposition. Sundays and holidays and off days, its feeding expense was the same. It required too much time to take care of, both before and after working hours.

With an Overland Delivery Wagon the expense stops when you put it in your garage. And it is ready for work and at your service any time, day or night, right through the year.

Complete equipment, including electric starter, lights and horn—speedometer, ammeter, etc., make the Overland motor wagon easy and safe to control. Any boy can drive it.

And remember this—Overland motor wagons share proportionately in the economies of our enormous production of pleasure cars. That is why we can offer such an exceptional value at so low a price.

See the nearest Overland dealer today. Let him explain the advantages of the Guaranty Time Payment Plan by which you can obtain one of these delivery wagons for immediate use on easy terms.

The Willys-Overland Company, Toledo, Ohio
Manufacturers of Overland and Willys-Knight Automobiles

Willys-Overland Motor Cars

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BOCK

Everything Rolls

Bock Bearings *combine* the great load capacity of the roller bearing with the good features of the ball bearing.

The bearing *end* of each roller is a section of a perfect sphere—and *rolls* in unison with the tapered roller.

Everything rolls in the Bock Bearing.

End friction is eliminated. For where other bearings *slide* the ball end of the Bock *rolls*.

We have tripled our capacity in order to meet the tremendous demand for Bock Bearings.

They are replacing other types as rapidly as we can turn them out.

The BOCK BEARING Co.
Toledo, Ohio

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To You Pleasure Car Dealers of America

FOR some time past many of you men who are handling pleasure cars exclusively haven't been getting rich any too fast.

You've been bucking not only old *High Cost of Living*, but there has been a general tendency on the part of pleasure car makers to be a little miserly in the matter of discounts—to say nothing of increasing competition.

Your pathway hasn't been strewn with roses, to say the least.

That's as true as anything you know, isn't it?

But if you will listen for a minute—or read a little farther rather—we'll give you an idea that can be coined into real money.

Did you ever stop to think of the profit you are passing up by not handling a good line of motor trucks?

Now *don't* stop right here and say, "Oh, well—I'm not fitted out to handle trucks."

You are. There's no doubt about it.

In the first place you are an experienced motor car man and you know how to sell cars and handle the business.

Also, you've *got* a place of business. You are already paying for rent, light, heat, etc.

You've got a service department.

Now, to handle a line of motor trucks you wouldn't add a nickel to these already existing expenses.

1-ton, 2-ton and 3½ ton. Scientifically developed semi-trailers. Write for booklet "A"—and agency terms.

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A Way To Bigger Business and to Greater Profits

YOU might have to hire an extra salesman or two. But the liveliest ones will want to work on a commission basis. We've never yet seen a star salesman who insisted on a salary.

Can't you see where you are missing a big bet by not handling trucks?

Now, we haven't said a word to you about Wilson Trucks, and we're not going to say much here.

Except this: No better motor trucks are built anywhere in the world. They are *under-rated*. They carry the load. And when you've sold a Wilson you've made a life-long customer.

Before we started building Wilson Trucks, five years ago, we spent 25 years building wagons up to 10 tons capacity. This experience is worth dollars to both dealer and user.

And we furnish a trailer system that is wonderful in its efficiency.

This trailer is not merely a body on two or four wheels. It is a scientifically developed haulage system. It will interest you. It can be used in tight places and backed around corners just like the truck itself.

And, finally, we let you make a white man's profit. We give you a decent discount. We don't skimp you. You can *live* selling Wilson Trucks.

There's good sense in all this; isn't there? There's truth in it.

And you can't successfully get very far away from the truth.

Let us tell you all about it. We'll show you how to make more money.

J. C. Wilson Company
486 Warren Ave. Detroit

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive $1095

Two-Ton Worm Drive $2200

Three-and-One-Half-Ton Worm Drive $3100

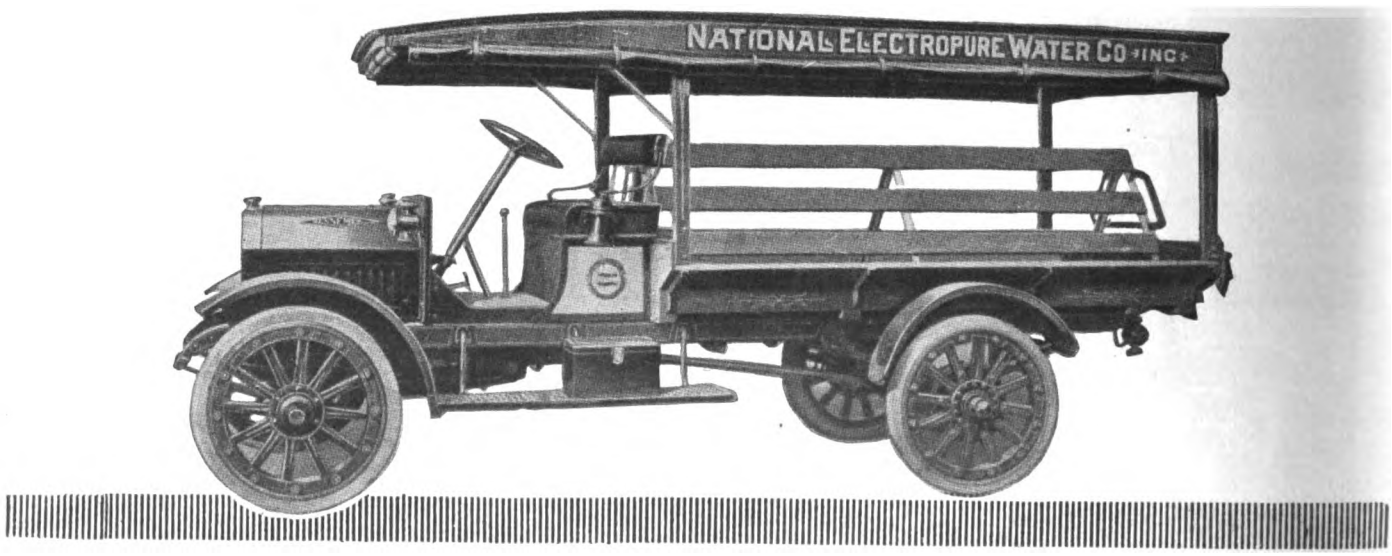
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

Bessemer Motor Truck Company **Grove City, Pa.**

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State



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THE giants of industry are coming to depend more and more on Firestone Giant Truck Tires for their heavy hauling.

With this massive single tread absorbing the strains and shocks at all times, regardless of irregularities in the road, new and higher degrees of truck efficiency are being obtained.

More rubber, more resiliency, more traction, less fuel, grooves or flutes prevent skidding, greater efficiency, Most Miles per Dollar.

Call in a Firestone man. He will tell you of this new tire and all our other types, one for every road, load and condition of service.

FIRESTONE TIRE & RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

Firestone TRUCK TIRES

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At the Nation's Service

For war or peace the motor truck assures the nation mobilizing power of incalculable importance. Hundreds of thousands of them are equally at the nation's service, whether their work be the arts of peace or the armed defense of America.

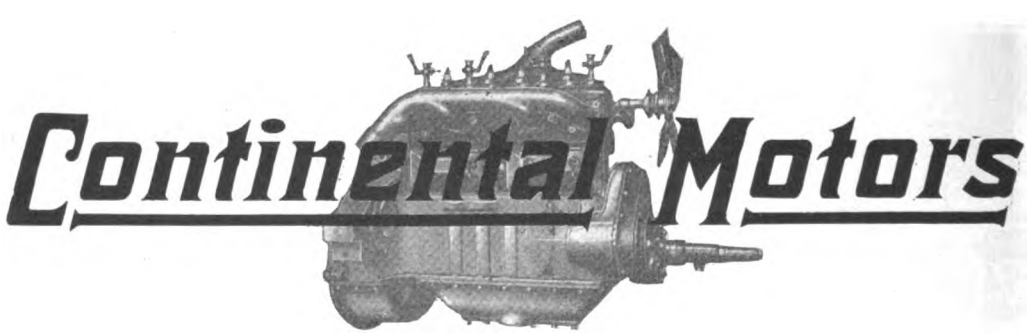
Readiness is typical of the motor truck; it is its indispensable quality. Users, dealers and manufacturers, as well, have learned by experience how especially dependable is the Continental-powered vehicle. Everywhere recognized as America's leading motor, the Continental stands today in readiness for any call. Upon demand, Continental power will serve you and our nation alike.

CONTINENTAL MOTORS CORPORATION

OFFICES: Detroit, Michigan

FACTORIES: Detroit—Muskegon

Largest exclusive motor manufacturers in the world



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Interchangeable with all other makes

Absolutely quiet
Greatest number of balls
Greater end thrust capacity
Deeper grooves and larger balls

SRB

MAXIMUM SILENT ANNULAR BALL BEARINGS



Sturdy Reliable Bearings

Standard Roller Bearing Co.

Philadelphia, Pa.

Makers of S. R. B. Annular Ball Bearings, Ball Thrust Bearings, Taper Roller Bearings, Steel Balls and *Rudge-Whitworth* Wire-Wheels

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U. S. Trucks
Floating Power Plant

Breaking into the country's hardest market

Detroit is the hardest market in the country for a truck built in another city.

But George W. Benham, dealer in U. S. trucks there for the last five months, has during that time sent in orders for 36 U. S. trucks. And that was the hard pioneering period.

He had never sold trucks before. But he had been a passenger car manufacturer, a parts maker, and he knew trucks.

For some time he had handled paper on time sales of trucks—and had come to know the advantages and disadvantages of many makes.

He selected the U. S. truck from many possibilities, and results have shown the wisdom of the choice.

His sales are made strictly on quality—with no concessions of any sort.

A favorite method of breaking through the powerful ring of competition was to take a hauling job on contract and let the truck sell itself.

There may be an opportunity like this in your town.

Worm-Drive, 2½, 3½ and 5 ton.
Chain-Drive, 2½ and 3½ ton.

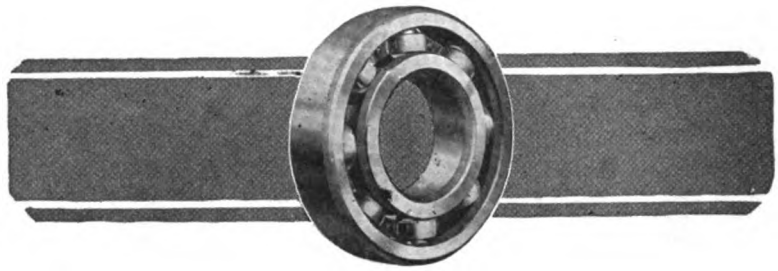
THE UNITED STATES MOTOR TRUCK COMPANY : : CINCINNATI, U. S. A.



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U.S. Ball Bearings

¶ Illustrated below is the new U. S. Ball Bearing factory—a modern, thoroughly equipped plant with a capacity of 10,000 quality bearings a day.

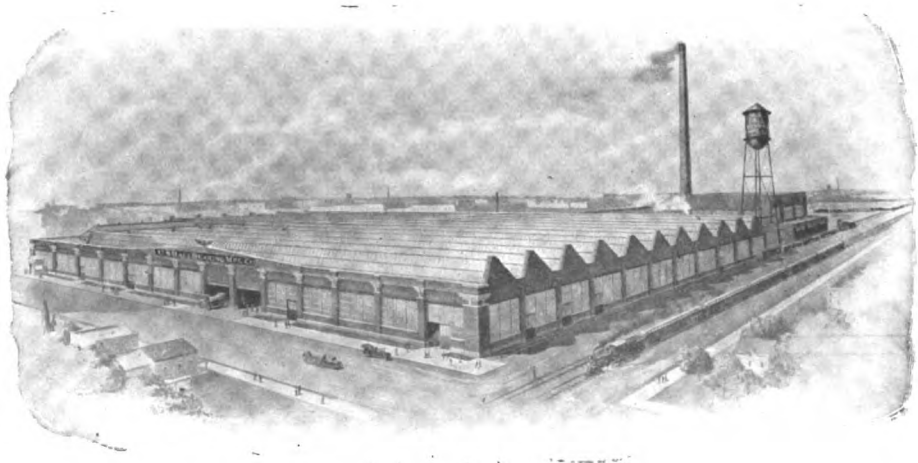
¶ Visitors to Chicago are cordially invited to pay a visit to this plant.

U. S. Ball Bearing Mfg. Co.

(Conrad Patent Licensee)

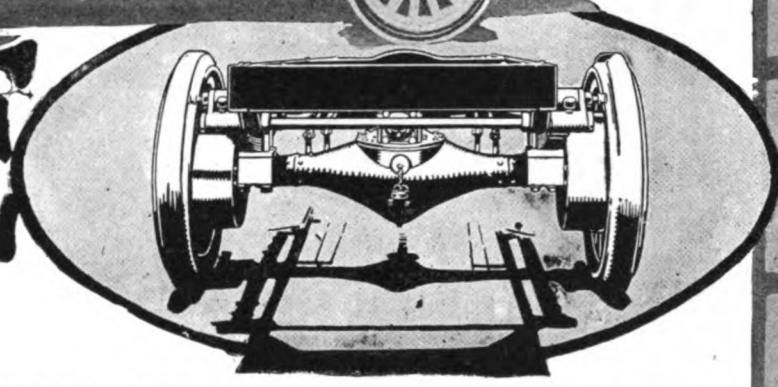
Palmer St. and Kolmar Avenue

CHICAGO ∴ ∴ ILLINOIS



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VALUE

VALUE—That Is the Answer to the Remarkable Demand for

D-E WORM-DRIVE MOTOR TRUCKS

¾ Ton, $875 1 Ton, $1375 1½ Tons, $1600 2½ Tons, $2250

How do you figure a truck proposition—how does ANY dealer or ANY business man figure it? On the plain, out-and-out dollars and cents plan: What the truck has. How it is built. What it costs.

That is how its value is arrived at.

There are other motor trucks with units as fine as we employ in the construction of D-E WORM-DRIVE TRUCKS. And others that are built as soundly and as conscientiously. But nowhere in the length and breadth of the land can you duplicate the VALUE that D-E WORM-DRIVE MOTOR TRUCKS represent at their prices.

No trucks of similar capacity have finer motors, stronger frames, sturdier front or rear axles—nor are there any that are built one iota better. We settled on the price AFTER we had built the best sort of a motor truck we could build.

Our greatly enlarged factory floor space and consequent increase in production permit our making additional dealer connections. If you are open to conviction, let us send you detailed specifications and dealer proposition. You will find both to be intensely interesting. Write or wire today.

DAY-ELDER MOTORS CORP. D WORM DRIVE E NEWARK N.J. U.S.A.

GENERAL SALES OFFICES: 1459 Broadway, New York City
P. K. Hexter, Sales Manager

DAY-ELDER MOTORS CORP.

MANUFACTURERS OF D-E WORM-DRIVE MOTOR TRUCKS

167 Ogden Street NEWARK, NEW JERSEY, U. S. A.

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IN the supreme test of motor car equipment—commercial car service—Fedders Radiators have amply proven their ability to uphold the reputation that has standardized their use on the best pleasure cars built. Our Engineering Department will gladly bring to your radiator problems the experience gained in more than fourteen years' building of highest grade radiators.

THE FEDDERS MFG. CO., Inc., Buffalo, N. Y.

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Nothing in the World like it -for Power-

Lycoming Foundry & Machine Co.
Williamsport, Pa.

LYCOMING MOTORS

Standard

MADE IN DETROIT USA

Motor Trucks

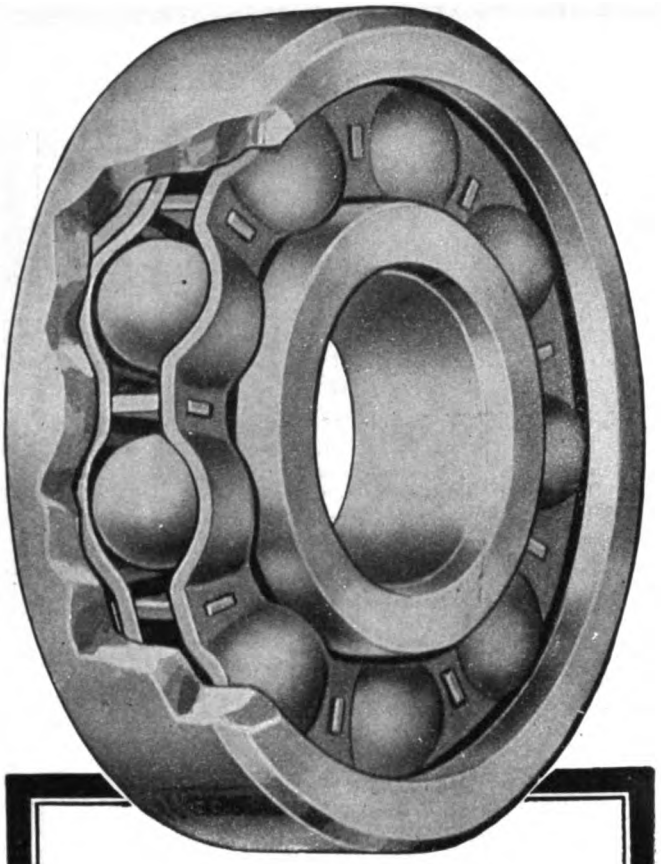
Reduce Transportation Costs For Your Customers

Standard Trucks incorporate in perfect balance units known the world over as the highest type of construction in their particular line.

They are daily solving the haulage problem for hundreds of concerns throughout the country. Responsible dealers looking for a high-grade line of trucks will find it worth while to investigate the standard.

Standard Motor Truck Co., Department 6. Detroit, Mich.





THE New Departure may not be the only ball bearing which gives satisfactory service in the highest types of automobiles, but there is a reason why **more** New Departure ball bearings than any other are used in American motor cars.

The reason why the demands for New Departures have persistently increased, so that this company is the largest manufacturer of ball bearings in the whole world, can be summed up in one word—quality.

The New Departure Manufacturing Co.

Conrad Patent Licensee

Bristol, Conn. Ford Bldg., Detroit

NEW DEPARTURE BALL BEARINGS

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NEVER-LEAK
Copper Asbestos-Filled
GASKETS

Get our estimate on your next gasket requirements. You will be agreeably surprised.

For producing absolutely gas-tight joints nothing has ever been invented to compare with Never-Leak Gaskets. You can protect yourself from all worries over compression leaks if you fully equip your motor with these Copper Asbestos-Filled Gaskets.

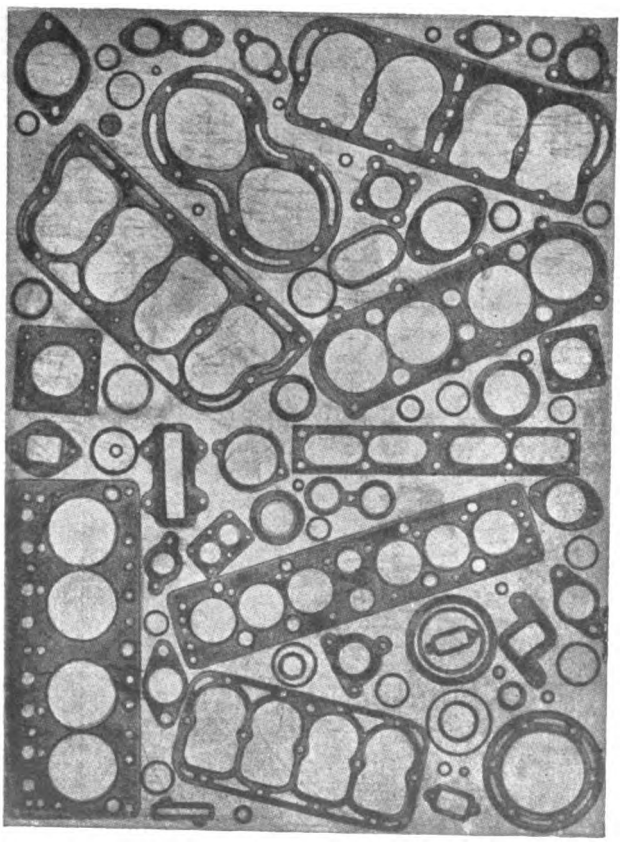
The copper gives malleable metal contact surfaces. The asbestos secures a body which retains a powerful spring under compression.

If you have gasket trouble of any nature consult our Engineering Force. This will involve you in no obligation or expense.

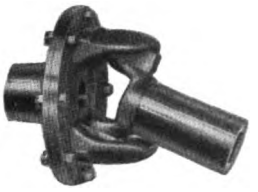
Write for our estimates. We are equipped with many thousand special dies such as here shown and can readily produce the gaskets you need.

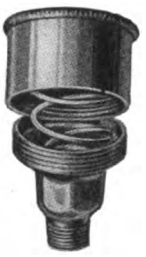
Have "Never-Leak" on every gasket.

The Fitzgerald Mfg. Co.
TORRINGTON, CONN.
Gasket Dept.









"EVANS" PRODUCTS

"Hele-Shaw" Clutches
"Evans" Joints
"M. & E." Grease Cups
Patented



Are designed and constructed to fully meet the strictest requirements of motor truck service.

Adopted by the following manufacturers: Baldwin Locomotive Works, Four Wheel Drive Auto Co., Kleiber & Co., Inc., Lange Motor Truck Co., Sterling Motor Truck Co., Twin City F. W. D. Co.
and many others.

Send Us Your Requirements. Our Engineering Department Is at Your Service

SOLE MANUFACTURERS

MERCHANT & EVANS Co
NEW YORK PHILADELPHIA WHEELING
BALTIMORE CHICAGO
ATLANTA ST. LOUIS
CLEVELAND KANSAS CITY

WATSON TRAILERS and SEMI-TRAILERS

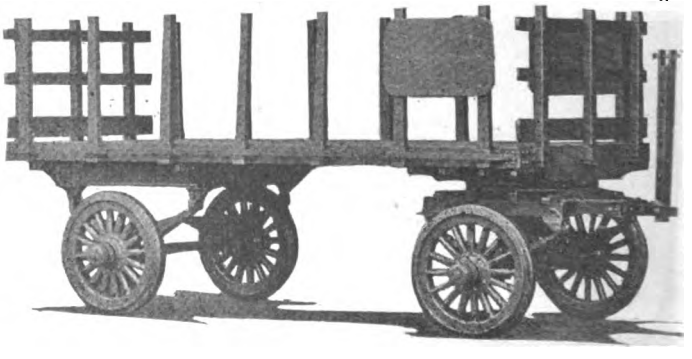
WE don't care how difficult hauling problems may be, the Watson line solves them and *keeps* them solved.

A Bottom Dump Trailer, a Platform Trailer, a Semi-Trailer, a Chassis for Special Bodies—a tonnage and type for every conceivable hauling job.

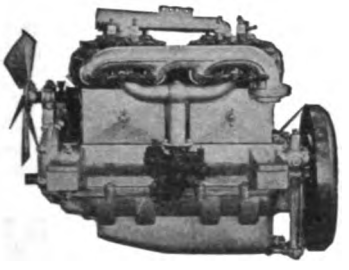
Watson Trailers and Semi-Trailers—backed by over a quarter century of exclusive wagon building—offer a line of profit producers for dealers tired of mediocre business.

We're cocked and primed to talk turkey TODAY—are you?

WATSON WAGON COMPANY
(Largest Manufacturers of Bottom Dump Wagons in the World)
28 Center Street, Canastota, N. Y.



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Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications.

BEAVER MFG. OOMPANY

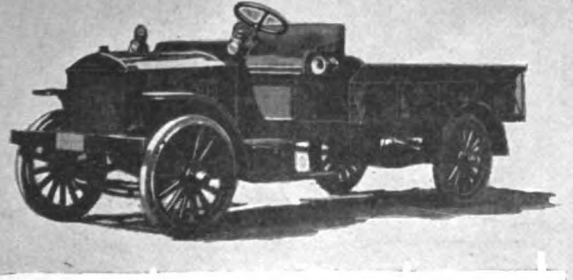
Milwaukee Wisoonsin

THE MARK OF A BETTER RADIATOR

G & O Radiators for Heavy Duty Service

The G & O Mfg. Co.
New Haven Connecticut

The GLOBE Truck
The Motor Truck PLUS



Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

Globe Motor Truck Co.
721 Wright Bldg. St. Louis, Mo.

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International Motor Trucks Sold on a Business Basis

A MOTOR truck must either make a dollars and cents saving that will justify a business man in buying it, or it must bring him more business and greater profits. We offer the **International Motor Truck** on that basis.

The models for 1917 were designed to satisfy experienced truck users. That is why the **International** is different from every other truck —why the radiator is behind the engine—why the engine is so easy to get at—why it is built from motor to body in one factory—why we feel that we can recommend it without reserve to every business man.

Every experienced truck owner, for instance, wants a shaft drive rear axle, but he wants it with chain drive strength and lightness. A combination of the two types gives truck owners the best of all rear axle service—an axle consisting of two members, a single piece forging to carry the load and a live axle for transmitting the power. This combination gives the quietness and neatness of the shaft drive with the strength of the chain drive axle—just what experienced buyers want. When you make your decision on a motor truck, you cannot get too much information on this **International Motor Truck** feature.

One of these sizes will meet your requirements: Model H chassis, 1500 lbs. capacity, $1225; Model F chassis, 2000 lbs. capacity, 128" wheelbase, $1500; Model F chassis, 146" wheelbase, $1550. Prices cash f.o.b. factory. (Prices subject to change without notice.) Write us for convincing folders that make every point clear.

International Harvester Company of America (Incorporated)

88 Harvester Building Chicago U S A

EXCESSIVE SPEED—

The Junk Pile's Greatest Asset

The development of motor haulage has made plain the necessity of a speed governor. Excessive speed always opens the way to high gasoline; repair, tire and general upkeep costs. Overspeeding makes high truck efficiency impossible.

MONARCH

Limits the Speed and the Expense

GOVERNOR

No truck is built for excessive speed. Regardless of the design and materials used, overspeeding is paid for by the shortened life of the truck.

The function of the Monarch Governor is to limit the speed without limiting the power. It is operative when the vehicle is in motion or standing. Let your experimental department test a Monarch Governor for thirty days. We'll gladly assist.

MONARCH GOVERNOR CO.
520 Bethune Ave. West, Detroit, Mich.



AGENTS WANTED



"Little Giant" in the service of the Inland Steel Company

Owing to territorial adjustments we now have several money making territories open to live agents. If you want to connect with a progressive motor truck manufacturer who backs his guarantee with $12,000,000.00 capital, who has had twenty-five years manufacturing experience and who has 25,000 satisfied customers in the United States

Here is Your Opportunity.

The *"Little Giant"* Line Includes

Little Giant Convert-a-Car.
(Converts any Ford into a one ton truck)
Model 15—1 Ton Worm Drive
Model 16—2 Ton Worm Drive
Model 17—3½ Ton Worm Drive

SPECIAL BODIES FOR EVERY PURPOSE

Write for Prices, Specifications and Terms

CHICAGO PNEUMATIC TOOL CO.

615 Little Giant Building CHICAGO

Branches and Service Stations Everywhere

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Real Value

THE KREBS COMMERCIAL CAR CO. CLYDE, OHIO U.S.A.

You get the full value of your money and more when you invest in a KREBS Truck.

Guaranteed by manufacturers with 16 years' experience in motor vehicle construction, the KREBS combines Simplicity and Low Maintenance with Efficiency and Reliability.

It contains a simple, powerful Continental Motor, a Timken-Brown Worm Drive, Renault type Radiator. The special KREBS Carburetor economizes your fuel and the KREBS Automatic Governor protects you against careless-

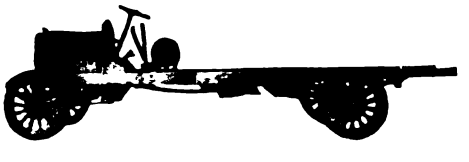
Krebs

ness and recklessness. The KREBS can be safely entrusted to an ordinary driver.

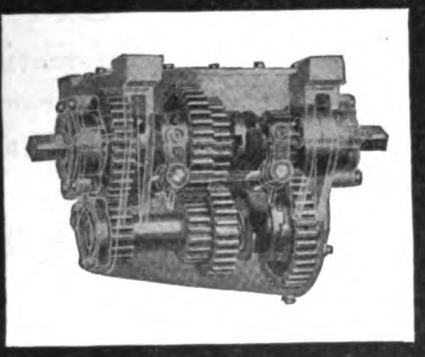
KREBS Trucks are made in 1½, 2, 3½ and 5-ton capacities. Body to suit requirements.

Send for KREBS catalog.

The Krebs Commercial Car Co.
Clyde, Ohio, U. S. A.



COTTA TRANSMISSIONS



All Gears Always in Mesh

ROCKFORD

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

DENBY TRUCKS

FOR TRAIL OR PAVEMENT

CONFIDENCE is perhaps the best sales-asset of the Denby dealer.

Confidence in the organization, in the personnel, in the design and construction of the truck. But more than all, confidence in the ability of the truck to perform any task that may be asked of it, with credit to its makers and satisfaction to its owners.

And this confidence is shared by the buying public. The buyer's attitude is one of faith, not of doubt; of acceptance, not unbelief.

Such a feeling can be built up only by years of proven worth and satisfactory service. Many trucks may deserve it; few, in the nature of things, can possess it.

But in the actual upbuilding of business for the dealer, Denby reputation is as important as the wonderful internal-gear drive, the sturdy economical power-plant or the scores of other features of efficiency.

And it would be equally valuable in your territory.

Denby Motor Truck Company
Dept. K, Detroit, Michigan



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Heavy Duty Truck Frames

Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

Added capacities together with latest type equipment enables our assuring you of satisfactory service.

Our engineers are at your service, and we solicit your inquiries.

DRIGGS-SEABURY ORDNANCE COMPANY
SHARON, PENNA.

MACCAR

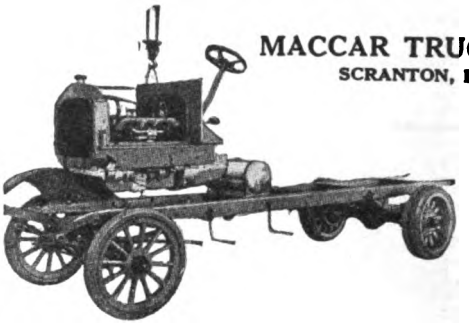
Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.

If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.

The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.

Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.



MACCAR TRUCK CO.
SCRANTON, PA.

BROWN-LIPE

transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

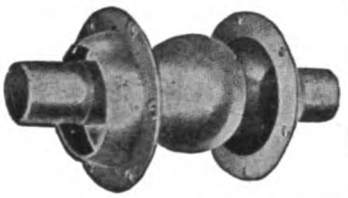
BROWN-LIPE GEAR CO.
SYRACUSE, N. Y., U. S. A.

BROWN-LIPE CHAPIN CO.
Differentials Transmissions

NEW YORK—Thos. J. Wetzel, 29 West 42d St.
SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C.

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BOSSERT



In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice. We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, axle housings, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



THE BOSSERT CORPORATION

UTICA, N. Y.

STEGEMAN 6 (SIX CYLINDER) TRUCKS

THE ONLY SIX CYLINDER



THE Stegeman is the only line of Trucks powered with a Six Cylinder Motor. This is the most sweeping development in the Truck Industry. A year's continuous tests have demonstrated the Stegeman Six Cylinder undisputed Master of the Truck situation—both as to economy and endurance.

Agencies Go Quickly

Because Stegeman Six Cylinder trucks with electric starter furnish a string of argument that clinch sales and back competition clean off the board.

Sizes 2, 3, 4, 5 and 7 Ton

Stegeman Motor Car Co. Milwaukee

POLACK TYRES

"The highest priced tire in America"

The higher profile of Polack European Standard truck tires protects the mechanical parts of your truck (the *real* purpose of rubber tires), saves repairs and shop lay-ups, insures safety through its anti-skidding qualities and provides comfort for the driver.

Polack Tires combine long lived service with resiliency, as is evidenced by the 10,000 mile guarantee, and the testimony of year after year users.

So Polacks, "the highest priced tires in America," are after all the lowest in *cost per mile,* not to mention the comfort, safety and uninterrupted *truck service* their use insures.



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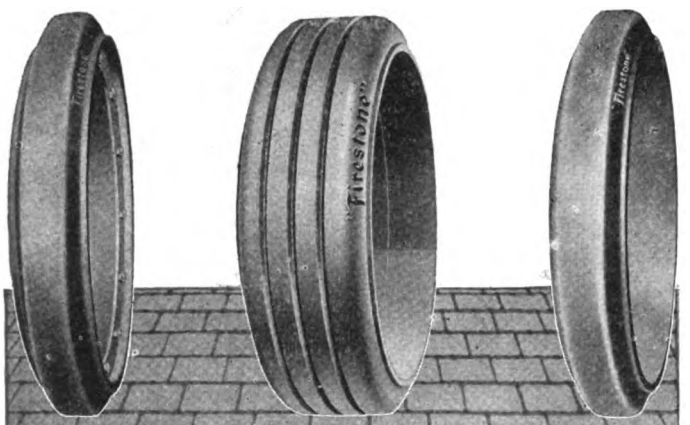
Mack TRUCKS

Mack Trucks are wonderfully durable. Over 7000 of them in daily operation are giving practical evidence of MACK efficiency and superiority.

"Performance Counts"

INTERNATIONAL MOTOR CO.
64th Street and West End Avenue
New York





FIRESTONE experts build truck tires for every load, road and condition of service. Firestone construction means longest wear and greatest resiliency. Call at branch or write us for literature.

FIRESTONE TIRE & RUBBER COMPANY
Akron, O. Branches and Dealers Everywhere

Firestone Truck Tires

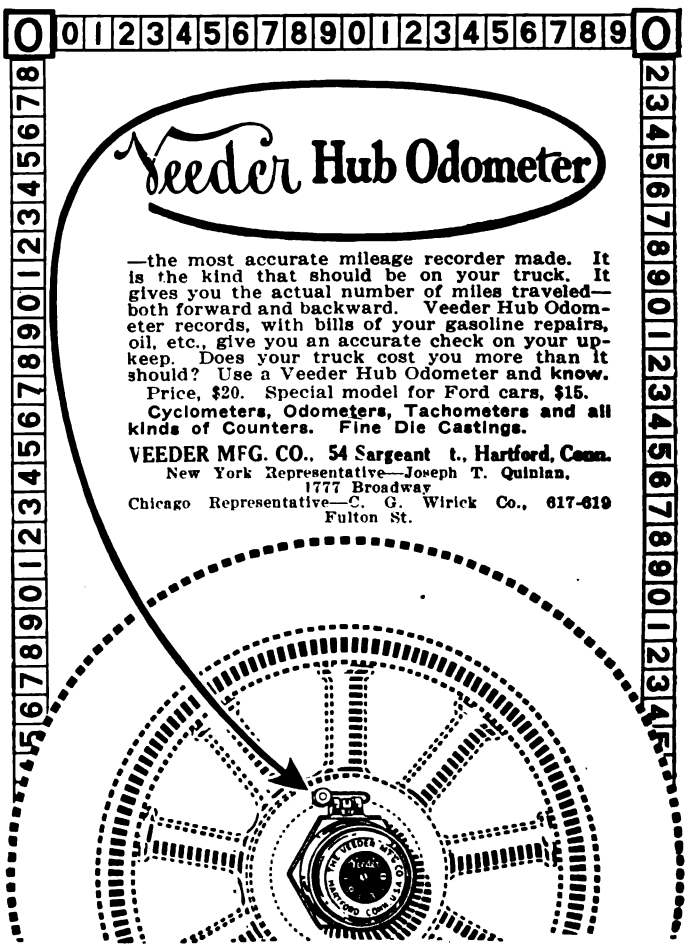
Veeder Hub Odometer

—the most accurate mileage recorder made. It is the kind that should be on your truck. It gives you the actual number of miles traveled—both forward and backward. Veeder Hub Odometer records, with bills of your gasoline repairs, oil, etc., give you an accurate check on your upkeep. Does your truck cost you more than it should? Use a Veeder Hub Odometer and know.

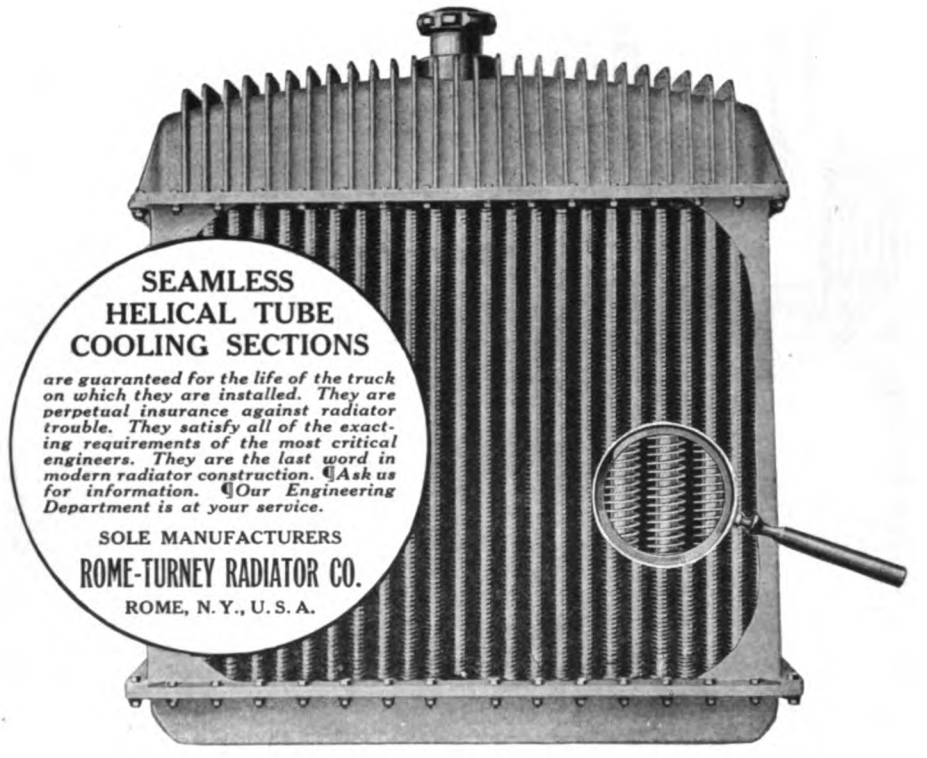
Price, $20. Special model for Ford cars, $15.

Cyclometers, Odometers, Tachometers and all kinds of Counters. Fine Die Castings.

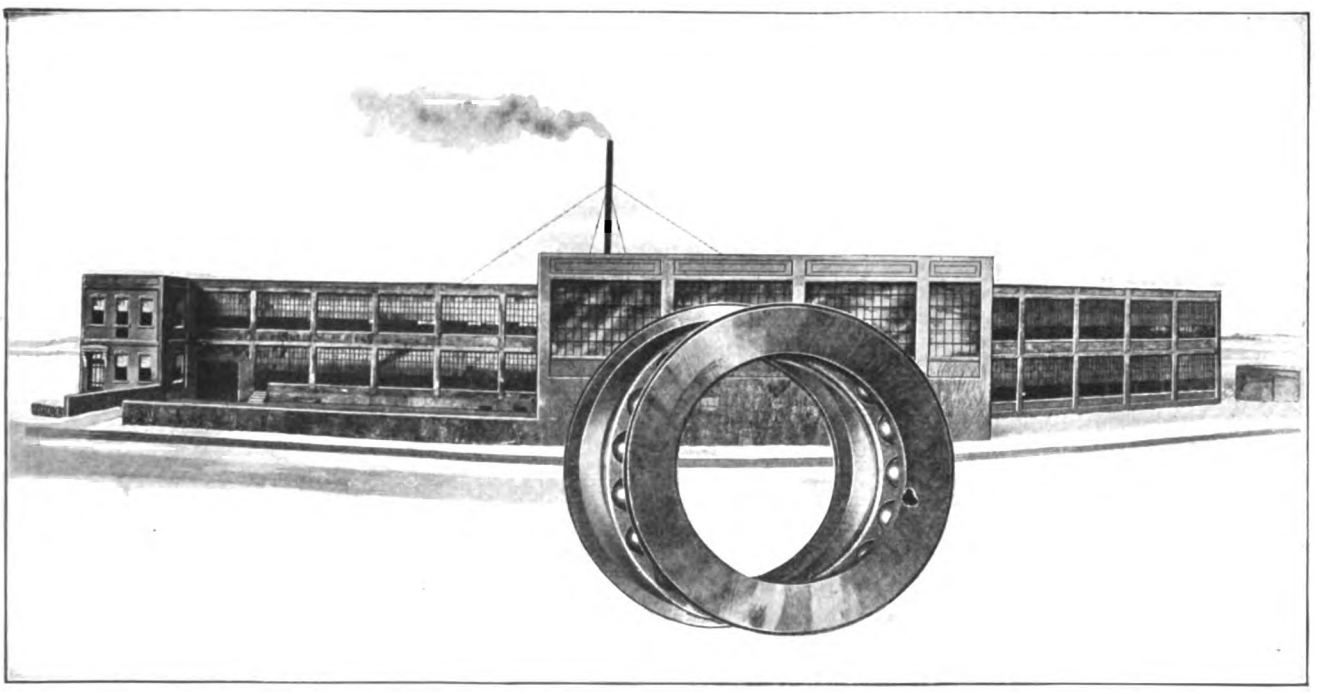
VEEDER MFG. CO., 54 Sargeant t., Hartford, Conn.
New York Representative—Joseph T. Quinlan, 1777 Broadway
Chicago Representative—C. G. Wirick Co., 617-619 Fulton St.



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THE FACTORY BEHIND THE CONTRACT



THE BANTAM BALL BEARING CO., BANTAM, CONN.

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90% of the load is carried on the rear Dearborn axle and heavy truck wheels.

Mr. Dealer:
You Can Make Big Money NOW!

RIGHT NOW in your own locality are scores of prospective purchasers of Ford-Dearborns who cannot afford $1500 for a truck, (the average price of a one-ton truck) but who would gladly buy a Ford-Dearborn at $350 plus a Ford chassis. You can get this business.

The Ford-Dearborn makes a *real* one-ton truck that will do all the work that any one-ton truck will do at one-third the cost. And the Dearborn Truck Company is a *real* manufacturing company with a big, well-equipped factory and it is *not* a stock selling organization.

$350 and a Ford, New or Old, Make a

FORD-DEARBORN One Ton Truck

The Ford-Dearborn is so designed that 90% of the load is carried on rear Dearborn axle with its heavy truck wheels, Baldwin roller chains, Baldwin cut steel sprockets, Jack shaft hangers and back rod hangers hot riveted to frame, not *merely* bolted.

Pruden artillery type wheels, guaranteed hickory spokes and felloes. Bock heavy roller truck bearings are used throughout.

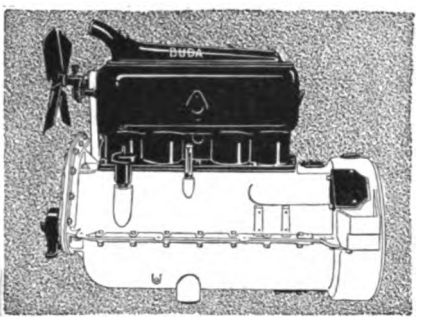
The Dearborn unit is made complete in our own factory and is guaranteed in every detail. We carry on hand all parts which can be supplied quickly.

Wire or write for dealers' Big Money-making proposition.

DEARBORN TRUCK CO.
1230 Campbell Ave. CHICAGO

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"LET US HAVE THE FACTS"—No. 5



MAINTENANCE OF COMPRESSION

It is comparatively easy to "build" the proper compression into any *new* motor—the real problem is to build the motor to maintain this compression through long periods of hard service.

The BUDA MOTOR

has a remarkable record in this latter respect for the reason that maintenance of compression largely depends upon the results of two long cherished ideals of the Buda plant. For thirty-six years the best the market affords has *always* been Buda material—"take time and build your best," the Buda slogan.

The materials in, and the machining of, Buda cylinders and pistons cannot be surpassed.

You or your engineer should visit the Buda plant and verify this statement, but first ask an old Buda owner how well the Buda Motor holds compression.

The new truck motor catalog is out. If you are interested in motors, write for it.

THE BUDA COMPANY, HARVEY (Chicago Suburb) ILL.

THE BUDA COMPANY
BUDA MOTOR
"The part to buy the car by"
ESTABLISHED 1881

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U. S. Trucks
Floating Power Plant

Breaking into the Metropolis

Last summer The Economy Motor Truck Company, Inc., of which Victor Neustadl is President, became distributors for U. S. trucks in New York and the metropolitan district.

The company had sold light trucks, but the distribution of heavy trucks was a new venture.

Realizing the vital importance of the selection, Mr. Neustadl went carefully into a number of truck propositions.

He chose the U. S. from many possibilities. The selling value of the floating power plant—an exclusive U. S. truck feature—attracted him. He liked the sturdy strength of the U. S. He had confidence in the organization behind the truck.

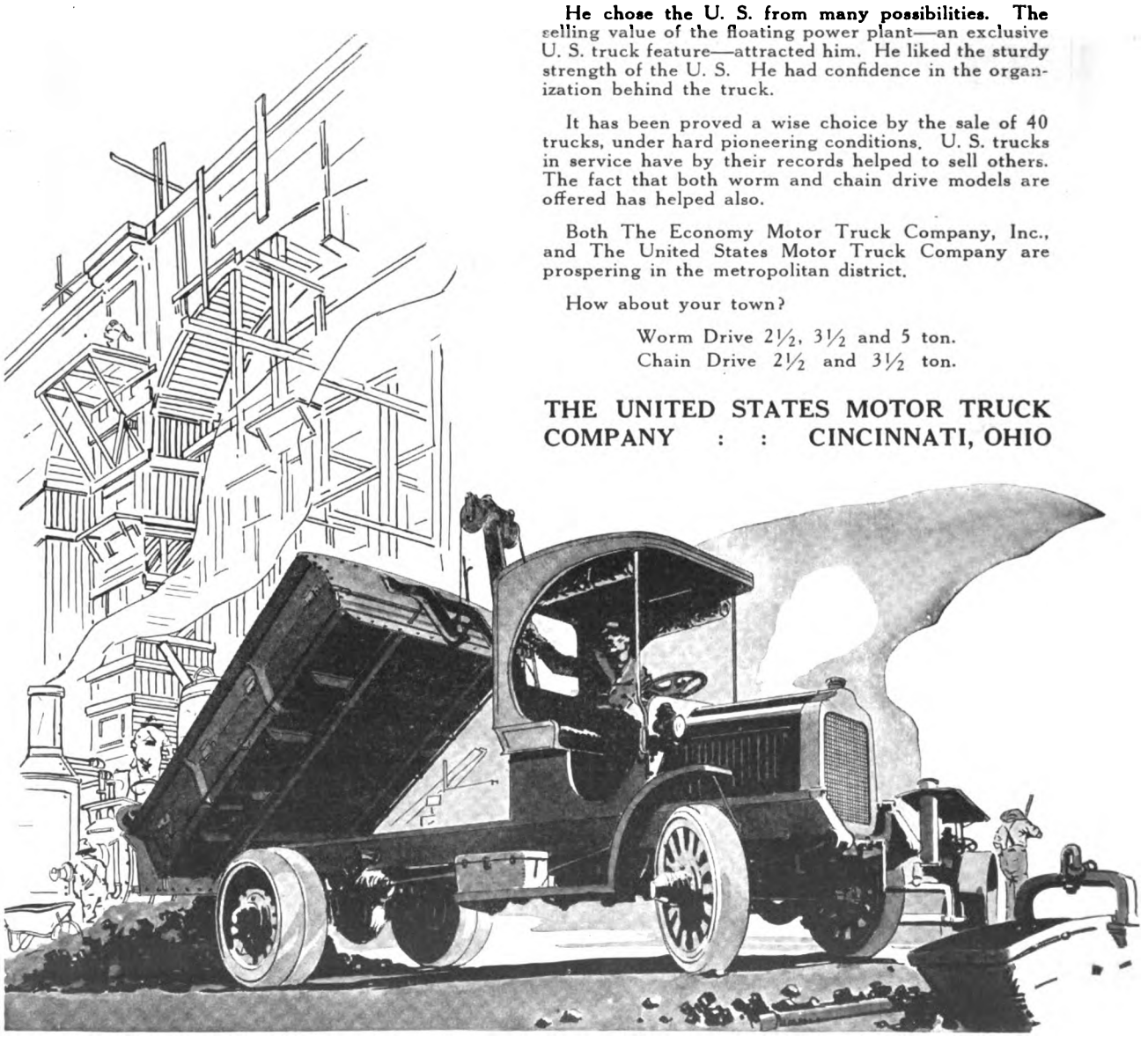
It has been proved a wise choice by the sale of 40 trucks, under hard pioneering conditions. U. S. trucks in service have by their records helped to sell others. The fact that both worm and chain drive models are offered has helped also.

Both The Economy Motor Truck Company, Inc., and The United States Motor Truck Company are prospering in the metropolitan district.

How about your town?

Worm Drive 2½, 3½ and 5 ton.
Chain Drive 2½ and 3½ ton.

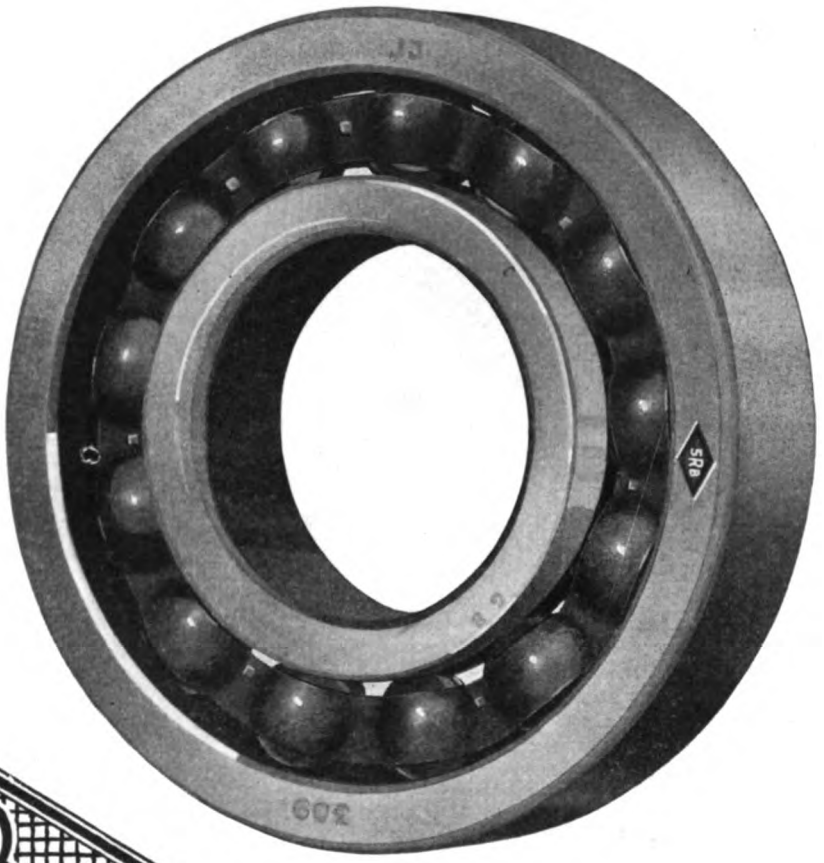
THE UNITED STATES MOTOR TRUCK COMPANY : : CINCINNATI, OHIO



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Noiseless

Sturdy Reliable Bearings



SRB

MAXIMUM SILENT ANNULAR BALL BEARINGS

Interchangeable with all other makes.

Deep grooves and larger balls.

Greater end thrust capacity.

Greatest number of balls.

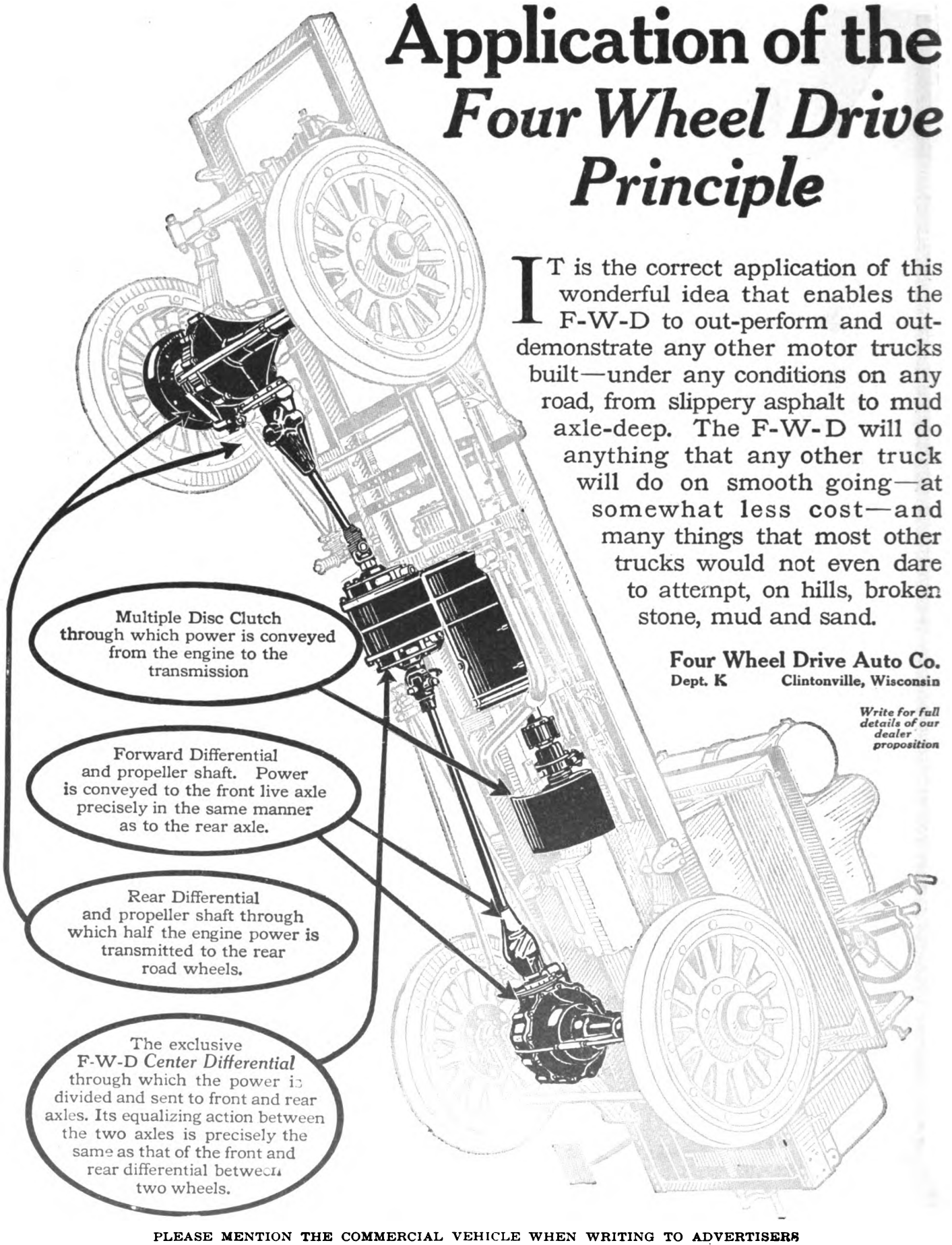
Standard Roller Bearing Co., Philadelphia, Pa.

Makers of S.R.B. Annular Ball Bearings, Ball Thrust Bearings, Taper Roller Bearings, Steel Balls and *Rudge-Whitworth* Wire Wheels

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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This Is the Exclusive F-W-D Application of the *Four Wheel Drive Principle*



IT is the correct application of this wonderful idea that enables the F-W-D to out-perform and out-demonstrate any other motor trucks built—under any conditions on any road, from slippery asphalt to mud axle-deep. The F-W-D will do anything that any other truck will do on smooth going—at somewhat less cost—and many things that most other trucks would not even dare to attempt, on hills, broken stone, mud and sand.

Four Wheel Drive Auto Co.
Dept. K **Clintonville, Wisconsin**

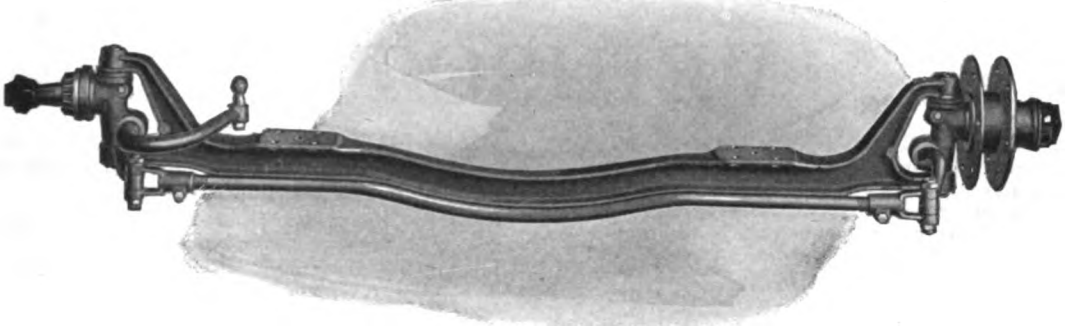
Write for full details of our dealer proposition

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Announcing—

COLUMBIA

2 to 2½-TON TRUCK FRONT AXLES



Built to help motor trucks **make good** in the most severe service—and endowed with a wide margin of overload capacity.

Like our sizes for Half-ton trucks, and Three-fourths to One-ton trucks, these new Columbia Axles are I-Beam forgings, double heat-treated. Spindles and Steering Arms are chrome-nickel steel. Each hub is equipped with two heavy-duty roller bearings.

Constructed with the same degree of careful attention and following the same general principles of construction that have now unqualified approval for Columbia Pleasure Car Axles.

We solicit your inquiries.

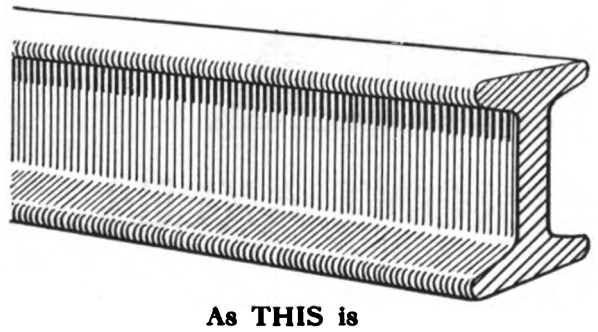
THE COLUMBIA AXLE COMPANY

Cleveland, Ohio

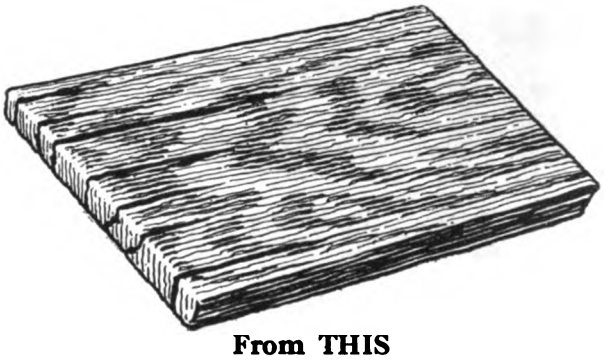
PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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IT'S AS DIFFERENT



As THIS is



From THIS

Has No Grain VEHISOTE No Laminations

It differs from a grained or laminated material largely as steel differs from wood.

Steel is a fibrous material made by a fluxing and molding process. So is VEHISOTE.

Wood grows in rings or layers and is essentially a laminated material—a succession of separate fibres clinging to each other.

Wood, like any laminated or layer material, is susceptible to splitting and separation of its fibres.

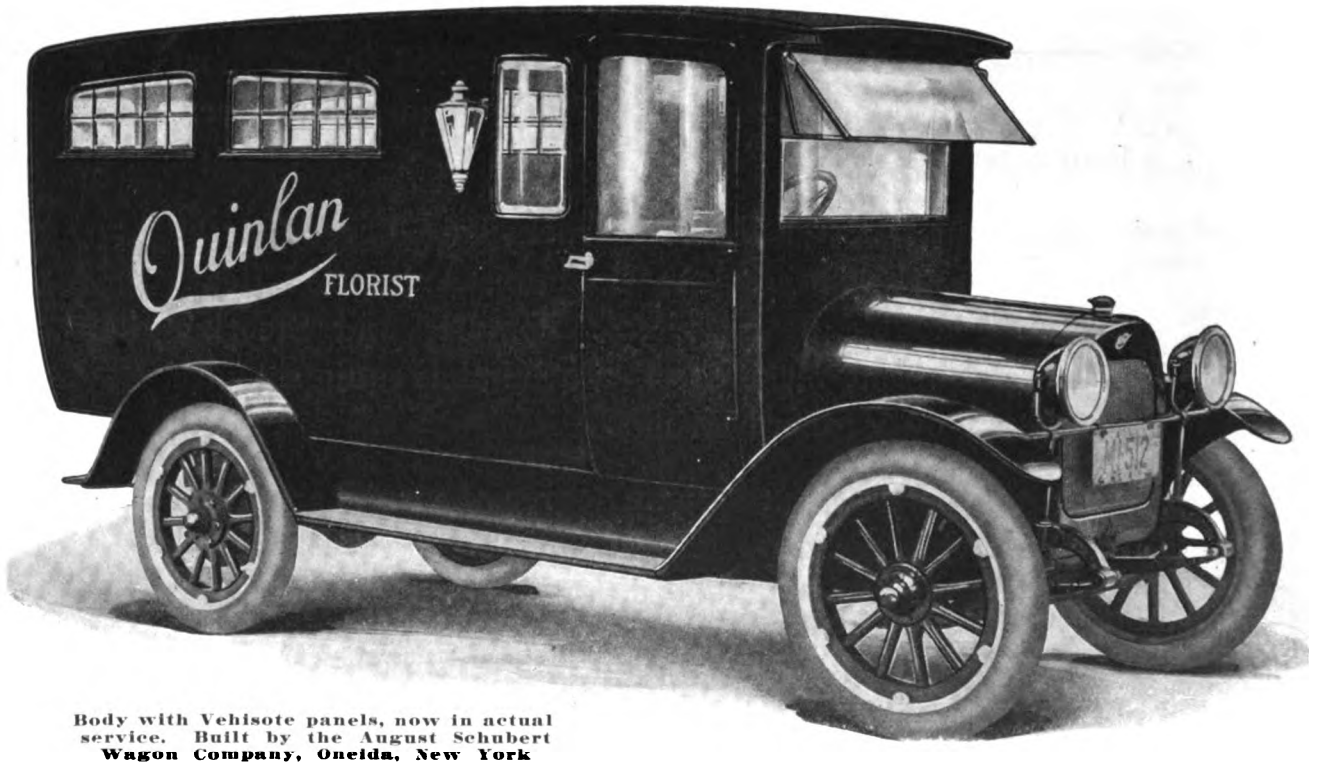
Homogeneous materials like VEHISOTE, in which the fibre is fluxed and run together, cannot split.

Steel is heavy. VEHISOTE is light.

Steel is expensive from an up-keep standpoint. VEHISOTE is economical.

From every standpoint VEHISOTE is an ideal material for vehicle body panels.

Try it.



Body with Vehisote panels, now in actual service. Built by the August Schubert Wagon Company, Oneida, New York

THE PANTASOTE COMPANY

11 Broadway, New York — **People's Gas Building, Chicago**

Vehisote is carried in stock by

The Scovel Iron Stove Company, San Francisco
The Sligo Iron Store Company, St. Louis
E. C. Kadow & Company, Chicago
C. H. Tiebout & Sons, Brooklyn, N. Y.
Gerhab & Ludlamn, Philadelphia
Wm. E. Kleine & Co., New York City
H. D. Taylor & Company, Buffalo
H. Hett & Sons, New York City
N. Langler & Sons, Brooklyn, N. Y.
Mossman-Yarnelle & Co., Fort Wayne, Ind.

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Announcing the

UNITED TRACTOR

6 TON CAPACITY

$2490

A startling and radically new method of hauling, completely revolutionizing present methods

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The UNITED Tractor Can Do the Work of Several Trucks --- Costs Much Less Than One

THE universal action of the rocking trailer platform, or turntable has ample flexibility to meet all irregularities or depressions of the worst roads.

The UNITED Tractor can turn in a much shorter radius than a truck and will not block narrow streets or alleys and can be readily backed to any position.

Trailers can be jacked-up and uncoupled from the UNITED Tractor in a few minutes.

The UNITED Tractor can do anything a truck can do, and many things a truck cannot do. The length of material does not matter.

Any type of trailer body equipment can be had on trailers, such as stake, gravity dump, steel dump with hydraulic hoist, etc.

The UNITED Tractor offers an amazing reduction of investment, depreciation, and operating expense. Its operating cost is about half that of a 5-ton truck.

THE UNITED Tr
hauling, the old
that a much grea
can be carried.

The driving wheels of the U
pulling, not **behind** the load **pus**
Tractor can operate a number of se
haul. This enables it to do the wo

The

of the UNITED Tractor lies in the
the chassis. The flexible drawbar p
all load weight from the chassis. Th
a "short wheel base truck". It remo
strain on clutch and motor, and pro
all unusual loads.

LOADING HAU

A UNITED Tractor can be kept busy constantly, the
loading and unloading periods. While the UNITED Tra
be loading, and a third unloading.

COMPARIS

Average cost of 5-ton truck with bo
Cost of 5-ton United Tractor -
Cost of Semi-Trailer - -

Difference in cost - - -

United Mot
671 Nor
Grand Rapids, M

Digitized by Google

successfully applies to
mmon-sense principle,
d can be pulled than

Tractor are **before** the load and
ith a motor truck. The UNITED
s, depending upon the length of
or three six-ton trucks.

ret

l spring suspension at the rear of
supplied in the UNITED removes
ED Tractor is in no sense merely
gidity from the chassis, eliminates
sure method of hauling any and

UNLOADING

ting the expenses of an idle truck and driver during
ng a trailer to its destination, a second trailer can

F COST

		$5,000
	$2,490	
	750	
	3,340	3,240
		1,760

Company
reet
igan, U. S. A.

The UNITED Tractor is Creating A Tremendous and Wonderful Opportunity for Dealers

BY the patented spring suspension, there is absolutely no payload weight on the chassis. This flexible drawbar pull enables the UNITED Tractor to negotiate roads that would be impassable for a motor truck.

The weight is distributed over three axles making it much easier on tires, roads and bridges. 60% of payload is carried on rear axle of trailer.

Old wagon equipment can be utilized, if desired, and when additional epuipment is needed, it is but necessary to buy a trailer at the cost of a few hundred dollars, as compared with the purchase of another truck at a cost of several thousand dollars.

No Load Shocks on Power Plant

The UNITED Tracter offers so many important advantages over the motor truck in economy, ability and efficiency that there is absolutely no question as to its decided superiority, from every angle.

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Mr. Dealer!

To those dealers who have the ability and facilities to do *big things*, the UNITED Tractor is an opportunity such as is rarely found.

The UNITED Tractor is beyond the shadow of a doubt, the most radical and important advancement in hauling methods since the advent of the motor truck.

The UNITED Tractor method is so far ahead of any other method, and from every conceivable angle, that there is no comparison. The UNITED Tractor offers so many exclusive and important advantages and at such an extremely low cost, that a future of unprecedented success is absolutely assured.

We are completing an addition to our plant, 60'x400'—having a capacity of 800 UNITED Tractors per month.

So, Mr. Dealer, fill in the coupon below and mail it to-day. Such real opportunities as this are taken up quickly.

TED MOTORS COMPANY
d Rapids, Michigan
TLEMEN:—

Check with an X one of the two squares below.

☐ Please send catalog; also have your representative call and give complete information relative to your agency proposition.

☐ Please send catalog only.

now sell the following trucks:

(Signed).....

.....

.....

.....

.....

Three-ton Tractor Later

At a little later date we will be in a position to make deliveries of a United Tractor of 3-tons capacity and priced proportionately low.

Digitized by Google



Look for the Texaco Sign

WHENEVER and wherever you see the Texaco sign you may rest assured that gasoline and motor oil of the highest quality are sold.

Texaco Motor Products always give a maximum of service to those who use them. Texaco Gasoline is the kind that you can always depend upon. Under all conditions it gives high power and good mileage per gallon.

TEXACO MOTOR OIL

has the visible earmark of a lubricant of the highest quality—a clear, clean, uniform color really distinctive of this splendid oil. Its performance when in use lives up to its appearance.

Texaco Motor Oil reduces friction to a minimum thereby enabling your motor to operate at its highest efficiency. It gives a perfect seal between piston and cylinder and allows no gasoline to leak into the crank case. Due to certain basic qualities it *cannot* deposit a hard carbon crust in the motor. If through the feeding of too much oil to the motor any carbon residue should be left, it will be in the form of a soft, fine soot that can do no harm and is easily wiped off.

Texaco Motor Oil may be obtained at most good garages. The safest way, the best way, to buy is in one or five gallon cans.

THE TEXAS COMPANY

New York Chicago
Houston

DISTRIBUTING OFFICES IN MOST CITIES

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Republic Truck Tires
are made of
Prōdium Process Rubber

THIS wonderful rubber makes tires last longer.

It gives them great resistance against heat.

It makes them almost immune to road cuts and chipping.

They wear down as evenly and smoothly as a piece of steel.

They grip the road and are springy and responsive to a remarkable degree.

Republic Truck Tires are laminated.

They are built up, ply on ply, so that there is no splice to give way under hard usage.

Try them out against any tire of like size. You'll find they last longer.

The Republic Rubber Company, Youngstown, Ohio

REPUBLIC TRUCK TIRES

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WINTHER
MOTOR TRUCKS
KENOSHA WIS.

Measure up Winther with the Government Specification

We regard the new U. S. Government truck specifications as being as nearly ideal for the purpose as could have been drawn.

We congratulate the quartermaster's department on having arrived at a solution of the motor transport problem that is not only best for military duty, but thereby most economical and satisfactory for commercial users as well.

We invite your attention to a most critical comparison of the new U. S. Army specification and the specifications of the Winther Truck.

Take up these specifications item by item and note for yourself the parallel.

It is interesting indeed to observe that, starting from the same point—motor truck experience in the recent Mexican expedition—one working from the military standpoint, the other from the commercial, how closely the conclusions agree.

Yet this must of necessity be so. The Mexican lesson is fundamental. And from that lesson we have learned how and of what to build the truck which may be counted upon to yield a standard of day in and day out service at a lower cost of maintenance than has ever been possible in the past.

Winther Trucks are internal gear driven—the first complete line of heavy service trucks with internal gear drive. Winther Trucks have locking differentials, drop forged axles, Timken bearings, four-bearing crankshaft, force feed lubrication, optional wheel base, 3½ per cent nickel gears, constant mesh transmission, and vanadium steel springs.

We repeat, only the border—where one year counts as ten—could have produced this truck. There is a model for every purpose:

Model 47—Maximum load 4000 pounds
Model 67—Maximum load 6000 pounds
Model 87—Maximum load 8000 pounds
Model 127—Maximum load 12000 pounds

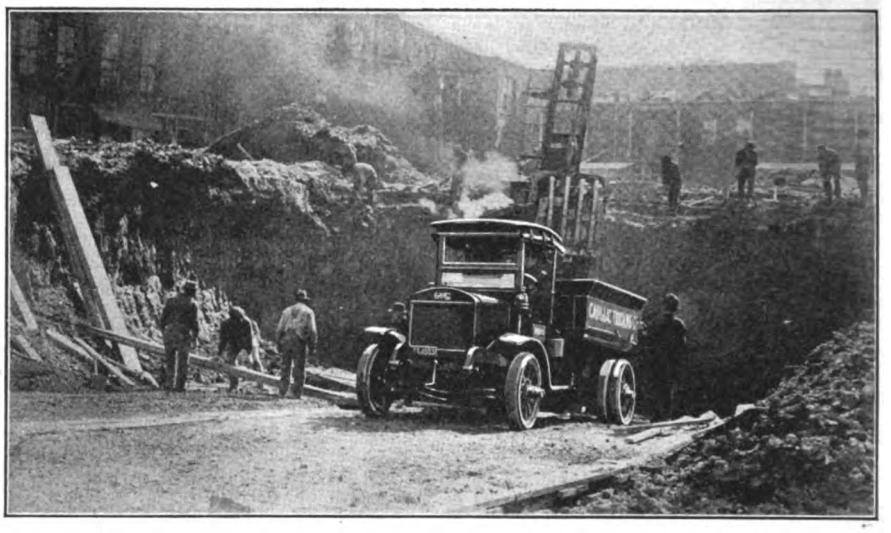
To established dealers we offer a connection that will prove the most profitable in the quality field.

On request we will mail booklet showing above mentioned comparison.

Winther Motor Truck Company
Kenosha, Wisconsin

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Excavating Prior to Erecting the new building for the Michigan State Telephone Company at Detroit. The Cadillac Trucking Co. has the hauling contract and is using motor trucks exclusively. The trucks work 20 hours a day, carry 6 tons or more each load, and make 34 trips a day. Norman T. Stone, owner of the Cadillac Trucking Company, says— "By experience we have found GMC Trucks best for contractors' work. For heavy hauling they can be depended upon. They have all kinds of power and, best of all, they stand up and do the work."



Saving Time and Money Excavating With

THE modern steam shovel has displaced the pick and shovel gang —and the motor truck has abolished for all time —slow-moving, inefficient horses and wagons.

GMC
GENERAL MOTORS COMPANY
TRUCKS

Excavating work is now done in a fraction of the time previously required, and at less cost per cu. yd. The contractor's labor question has been logically solved, for, aside from steam shovel operators and truck drivers, few men are employed.

GMC Trucks have demonstrated their ability to do this work, and have shown by actual performance what they can accomplish. In many of the larger cities practically all excavating jobs are being handled by motor trucks exclusively.

Now it's our move—it's up to us, as truck dealers.

Let's see to it that every contractor in our territory has the facts and figures placed before him.

Let's bring to his attention photographs of GMC Trucks at work.

Let's have him realize what GMC Trucks have done for others they can and will do for him.

Let's sell him first on the motor truck idea. Let's prove to him that the trucks are so far superior and have so many advantages over all methods of transporting excavated earth—in such a logical way—that the only remaining question in his mind will be—**which** truck.

Let's get started and develop this business right away. Send for photograph and complete information on the performance of GMC Trucks in excavating work.

GENERAL MOTORS TRUCK COMPANY

PONTIAC, MICHIGAN

New York Philadelphia Boston Chicago St. Louis San Francisco

Distributors Most Everywhere

(197)

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GOODRICH

TRUCK TIRES



Long Mileage;
Freedom From Trouble;
Backed by the Biggest
System of Service Stations
in the United States

Look for the Sign of Goodrich Service

EVERY important trucking center has its GOODRICH Service Station, amply stocked with truck tires of all sizes and equipped for their prompt removal and application.

Good Intentions do not produce Good Service. Size Counts.

This unparalleled organization maintained by the World's Largest Rubber Factory is at your command.

GOODRICH Service means less "time-out" for your trucks.

GOODRICH Truck Tires keep your trucks on the job.

THE B.F. GOODRICH COMPANY

AKRON, OHIO

TRADE MARK

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Ball Bearings
Other Bearings

The number of customers doesn't always designate the quality of the product.

Never mind the fact that this type of bearing or that is used on the majority of cars.

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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for Efficiency-
for Price

¶ Think rather of the fact that ball bearings are used almost exclusively on the real cars of class in America, and *exclusively* on such foreign cars as the Rolls-Royce, Renault, Daimler, Peugeot, Mercedes, Fiat, Minerva, Panhard, Delauney-Belleville, etc.

U. S. Ball Bearings

In other words, remember this:

¶ That whenever and wherever a few cents additional cost to the bearing is not considered above the life and performance of that bearing—there you will find ball bearings, and no other type of anti-friction device.

U.S. Ball Bearing Mfg. Co.
(CONRAD PATENT LICENSEE)
Chicago Illinois

U.S.
BALL BEARINGS

¶ U. S. Ball Bearings are manufactured in a new modern-equipped plant with a capacity of 10,000 quality bearings per day. U. S. Ball Bearings are produced in the following types:

RADIAL TYPE
CUP AND CONE TYPE
COMBINATION DOUBLE-ACTION
PLAIN THRUST
GROOVED THRUST
DOUBLE DIRECTION THRUST

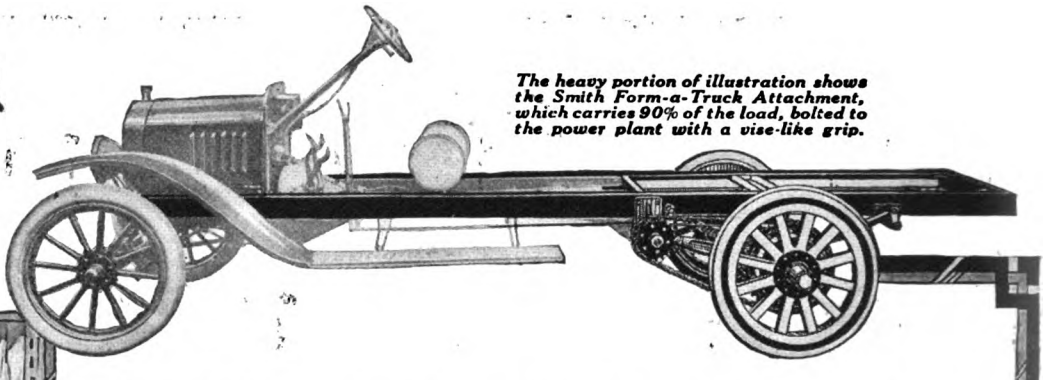
¶ Our Engineering Department will gladly work in conjunction with any manufacturer in laying out ball bearing mountings and adaptations.

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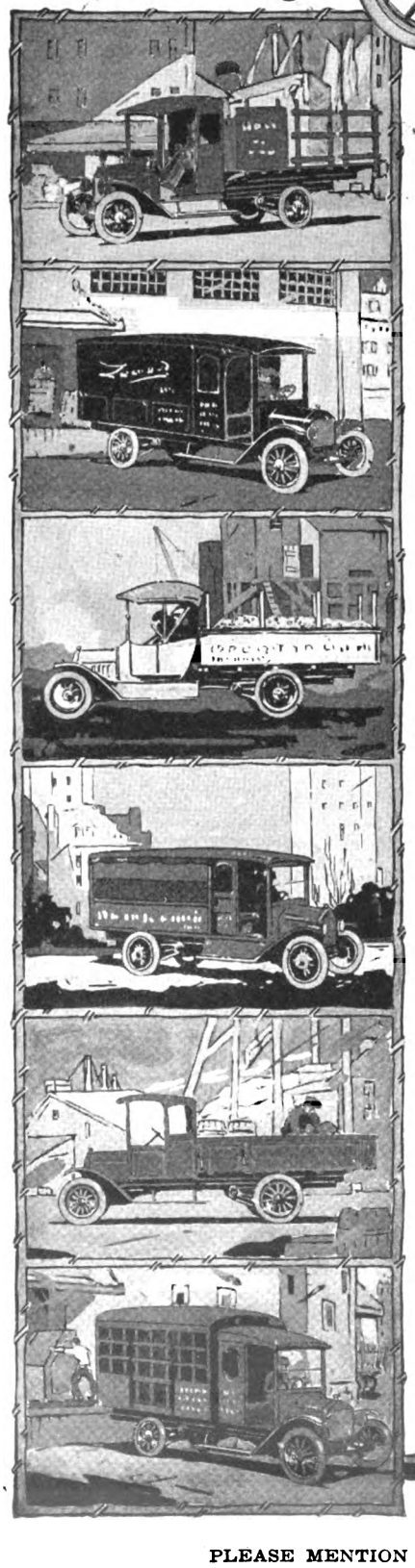
Smith Form-a-Truck

$350

f.o.b. Chicago



The heavy portion of illustration shows the Smith Form-a-Truck Attachment, which carries 90% of the load, bolted to the power plant with a vise-like grip.



500% Increase in Dealer Profits Already in Sight

THE demand for Smith Form-a-Trucks in sight for the next eight months practically guarantees profits for Smith Form-a-Truck dealers 500% greater than last year—and last year Smith Form-a-Truck dealers made more money than any other dealers in the motor truck industry.

18,000 Smith Form-a-Trucks have been sold for immediate delivery in January, February, March and April.

Sales at this rate will demand a production of 60,000 this year, 500% in excess of our total production for 1916.

And if the increase which April shows over January keeps up, there is no end to the volume of business to be done by Smith Form-a-Truck dealers.

April sales are 800% in excess of January sales: 400% in excess of February sales: 100% in excess of March sales.

—and 50% of the production which at the start of this year we believed would take care of the entire year's business.

The 10,000 Smith Form-a-Trucks sold for April delivery is equal to the entire production for 1916.

And Smith Form-a-Truck dealers are getting the profits out of this huge business.

Territory is already at a premium. Dealers are being offered big cash bonuses for their sales franchise.

There is still room for big dealers who can qualify.

Many of the livest dealers in the industry—the biggest money makers—the men with the biggest reputations, have moved to new sections of the country where there was a Smith Form-a-Truck dealership available—they saw the real profits to be made.

If you are qualified to be a Smith Form-a-Truck dealer, this is the biggest opportunity you have ever had offered to you. Wire today.

Smith Motor Truck Corporation

Manufacturers of Smith Form-a-Truck

Executive Offices and Salesroom: Smith Form-a-Truck Building

Michigan Boulevard at 16th St., Chicago

Eastern Branch, 1834 Broadway, New York
Southern Branch, 120 Mariette Street, Atlanta
Kansas City Branch, 1808 Grand Avenue
Pacific Coast Branch, Pico and Hill Streets, Los Angeles, Cal.

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WHY IS ONE TRUCK TIRE BETTER THAN OTHERS?



In all kinds of service, on all sorts of roads, in all states and many countries, the Goodyear S-V Pressed-On Truck Tire has proved its marvelous superiority.

Proved it by resisting wear through many extra thousands of miles, by providing perfect, power-saving traction, by pillowing huge loads on rough roads and smooth, by doing all the things a tire can to reduce the cost of efficient cartage.

Why is the S-V better? What gives it so much greater resilience and durability?

Design is one factor. A cross-section of the S-V shows gum distributed to form the most efficient cushion of which solid rubber is capable, to present the broadest possible surface to road wear and still resist all cutting and chipping at the edges.

The method of molding counts, too. S-V is pressed out from a patented machine which knits the millions of tiny particles into a wear-defying mass.

But what's *in* the tire counts most. New rubber only, of the highest grade, is used. No shoddy ever finds its way into S-V's. Minerals are necessary to attain the proper toughness, but in this tire there is more rubber in proportion to the mineral than in others.

These are the final reasons for S-V superiority. They account for S-V's marvelous performance—mileages up to 20,000 on country routes and 40,000 in strenuous city service.

They tell why one truck tire is better than others.

The Goodyear Tire & Rubber Company
Akron, Ohio

GOODYEAR
AKRON

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Mobilize For Business

THE deciding factor of the war will not be military force entirely. During the months that are to come, the element of most vital importance is the *productive possibilities* of our nation.

Now, more than ever before, must we face and solve the supreme test of our national efficiency—and gauge ourselves by the results.

We must do *more work quicker*—and *better work cheaper*—if we are to measure up to the task before us.

TO cut out waste—that is the keynote. And chief among the things we waste is *time*—a factor of production whose cost is easily computed.

Time has been lost through inefficient methods. Production has been decreased in direct proportion.

Therefore, whatever will save time is worth our study. War-time business will be done by those who *do things* quickest—by men and firms who catch the spirit of the hour.

FOR speeding up a nation's business from farm to market—from factory to railroad—the motor truck is now a necessary unit.

Through it, the vital element of time is conserved for bigger uses—labor's power made more productive in the shop and on the farm.

Once regarded merely as an indication of "progressive policies," its use is now *essential* to success.

Are *you* mobilized for business? Is *your* business service up-to-date?

These, and other questions, you must face. And meet them with the best truck for your needs.

IN this task of motorizing—and modernizing—a nation's haulage, the Covert Transmission plays a part.

You will find the Covert built into many motor trucks of the highest standards—motor trucks whose makers insist upon *dependability* in every vital point.

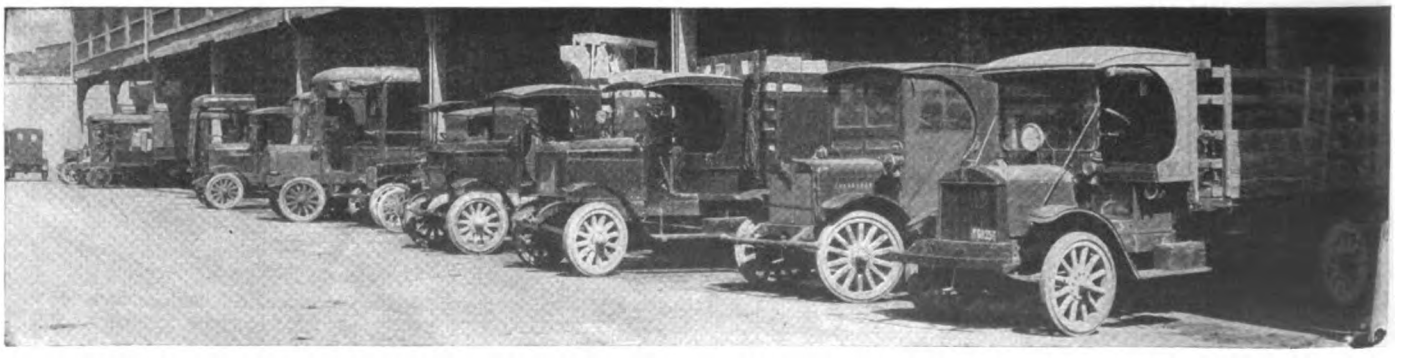
So, mobilize for bigger business with a *proven* motor truck—and make sure that its transmission is from the *proven* Covert line.

Covert Gear Company, Inc.

Sales, Engineering and Service

967 Woodward Ave. DETROIT, MICH.

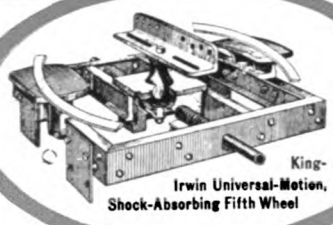
Factory: Lockport, N. Y.



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This Universal Motion Shock-Absorbing Fifth Wheel another Triumph for King TRAILER

ANN ARBOR MICH.

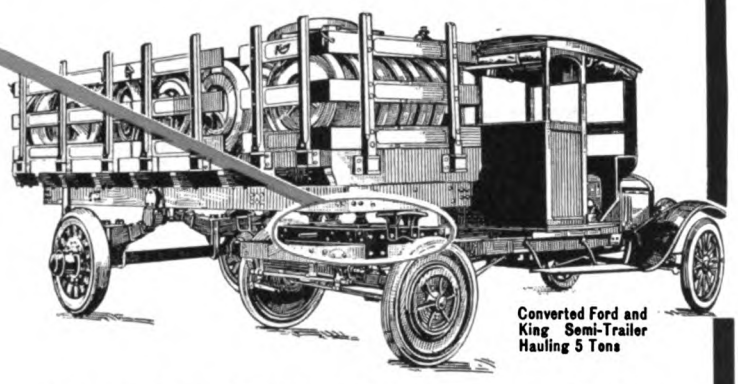


King-Irwin Universal-Motion, Shock-Absorbing Fifth Wheel

The man who knows the *past*, realizes the *present*, and anticipates the *future* possibilities of **Hauling and Delivering by Motor Truck** will instantly recognize the fact that this new *Fifth Wheel* has solved—in a practical way—all *light* and *heavy* trucking problems.

The King-Irwin *Universal-Motion* Shock-Absorbing Fifth Wheel is the farthest advance ever made in perfecting the Semi-Trailer.

Until the invention of the King-Irwin Fifth Wheel the practicality of the semi-trailer had been questioned. Now it is assured—definitely settled. The King-Irwin Universal-Motion, Shock-Absorbing Fifth Wheel has made the semi-trailer practical for all kinds of hauling, over all kinds of roads. For quick, sharp turns; for loading and unloading in small space—narrow streets and alleys. It insures perfect balance of the load. Eliminates strain, shock and jar from the tractor. Lessens upkeep. Insures perfect traction. The King-Irwin Universal-Motion, Shock-Absorbing Fifth Wheel has revolutionized the road transportation of merchandise.



Converted Ford and King Semi-Trailer Hauling 5 Tons

King Semi-Trailers Quadruple Truck Capacities

It is a well-known scientific fact that a motor car will pull three times the load it will carry. That's where the real economic value of the King Semi-Trailer lies. The King Semi-Trailer, equipped with King-Irwin Fifth Wheel, carries 75% of the load weight—the tractor 25%. Thus, as in the illustration, a converted Ford of one ton capacity with a King Semi-Trailer, safely hauls 5 tons. Under these conditions, the value of the King Semi-Trailer cannot be overestimated. Mills, Factories, Lumber Yards, Dairies, Storage and Moving Van Companies find it indispensable to the economical handling of their business. King Semi-Trailers, used in relays with one tractor, cut the loading, unloading and hauling equipment and expense to bed-rock.

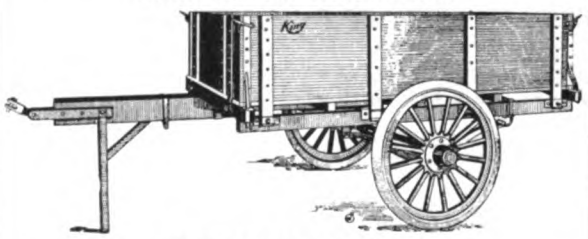
King Semi-Trailers Made in Three Sizes

No one can build a better, more substantial, practical, smooth-running semi-trailer unit than the King. King Semi-Trailers are regularly made with "standard" stake body, in 1½, 3 and 5 ton capacities, on the following specifications:

	1½ Ton	3 Ton	5 Ton
Body	5'6"x12'	5'6"x14'	5'6"x14'
Tread	56"	56"	56"
Height	43"	43"	46"
Tires	34"x3½"	36"x5"	36"x6"
Springs	42"x2½"	42"x3"	48"x3½"
Axles	1½x2½	2x3	2½x3½
Bearings	Roller	Roller	Roller

King Semi-Trailers are designed for use with standard auto chassis, converted truck units and commercial trucks of all capacities. The duty to which the semi-trailer is to be put determines its capacity. All King Semi-Trailers are equipped with the great King-Irwin Universal-Motion Shock-Absorbing Fifth Wheel.

THE KING TRAILER



"THE TRAILER KING"

The best will always lead. That's why the King Trailer is known to Dealer and Merchant as "the Trailer King." The King is designed by capable mechanical engineers; built by expert mechanics, of the best materials money can buy. The body is of well-ironed hardwood. The oak draw-bar is of the adjustable type. The (patented) King Universal-Motion, Shock-Absorbing Coupler is of scientific, all-steel construction. It makes the King Trailer "trail" perfectly, without jerk, strain or drag on the car. The King has 7000 mile guarantee truck-type tires; artillery wheels; ball-bearing axles; automobile springs. It is built like a truck to do a truck's work. The King is the best, lightest running, most economical trailer on the market. It makes a light delivery truck of any pleasure car.

King-Irwin UNIVERSAL-MOTION SHOCK-ABSORBING Fifth Wheel

This improved Fifth Wheel is made in three sizes:

The 1½ ton King-Irwin Fifth Wheel, with 20 in. circle, is especially designed for use with Ford cars or other light roadsters.

The 3 ton King-Irwin Fifth Wheel has 32 in. circle. It may be used with converted truck units, commercial trucks, or heavy wagons to produce a 3 to 5 ton tractor-semi-trailer.

Large size (5 ton) King-Irwin Fifth Wheel has 34 in. circle and will care for heavy-duty tractors and commercial trucks of 3 to 5 ton capacity for heavy hauling up to 13 or 14 tons.

All King-Irwin Fifth Wheels have the same universal-motion, shock-absorbing features. The springs (see illustration) are put in under compression so that in starting and stopping the tractor the weight of semi-trailer and load is absorbed by the compression springs. In this manner all shocks of road obstructions, grade crossings, street-car tracks, etc., are absorbed.

Universal motion is accomplished by a ball and socket joint which permits turning and rocking in all directions. Stability is maintained by a circle plate working on rub-irons.

The King has solved all hauling, trucking and delivery problems for all time. It places King dealers in position to dominate the light and heavy hauling field. The King-Irwin Universal-Motion, Shock-Absorbing Fifth Wheel—The King Semi-Trailer—The King Trailer. This is a complete—an unbeatable line. By it, every question of road transportation is answered. It covers the entire hauling field—the safe, economical delivery of anything from a half ton to fifteen tons, at minimum road-ton-mile cost. If you're a Dealer, you want the King line. USE THE "DEALER COUPON" AT THE LEFT.

If you're a Merchant, Farmer, Manufacturer, you want to know about the King line. USE THE "GENERAL COUPON" AT THE RIGHT.

King Trailer Company

612 Main Street, Ann Arbor, Mich.

DEALER COUPON

King Trailer Co.
612 Main St.
Ann Arbor, Mich.

Gentlemen: Please send full details of your King Trailer, Semi-Trailer and Fifth Wheel sales plan, including prices, terms, discounts and special demonstrator proposition for dealers.

Name.....

Address.....

Business.....

GENERAL COUPON

King Trailer Co.
612 Main St.
Ann Arbor, Mich.

Gentlemen: Please send full information and descriptive literature relating to the King Trailers, Semi-Trailers and Fifth Wheels, together with the prices and name of nearest King Dealer.

Name.....

Address.....

Business.....

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① Strength ② Simplicity ③ Speed

STRENGTH without excessive weight
SIMPLICITY without cheap construction
SPEED without sacrificing Strength or Simplicity

BESSEMER TRUCKS

The requirements of truck users and the interests of truck dealers have been perfectly combined in

A Master Product

which serves each to their mutual advantage.

The Bessemer models represent the highest standard of truck construction.

In design, material and workmanship we have put years of experience and the result is a motor vehicle that under expert examination proves incomparably better than trucks with which it is tested.

We solicit inquiries from the trade and from those who already use trucks or contemplate using them.

One-Ton Internal Gear Shaft Drive $1095 | **Two-Ton Worm Drive $2200** | **Three-and-One-Half-Ton Worm Drive $3100**

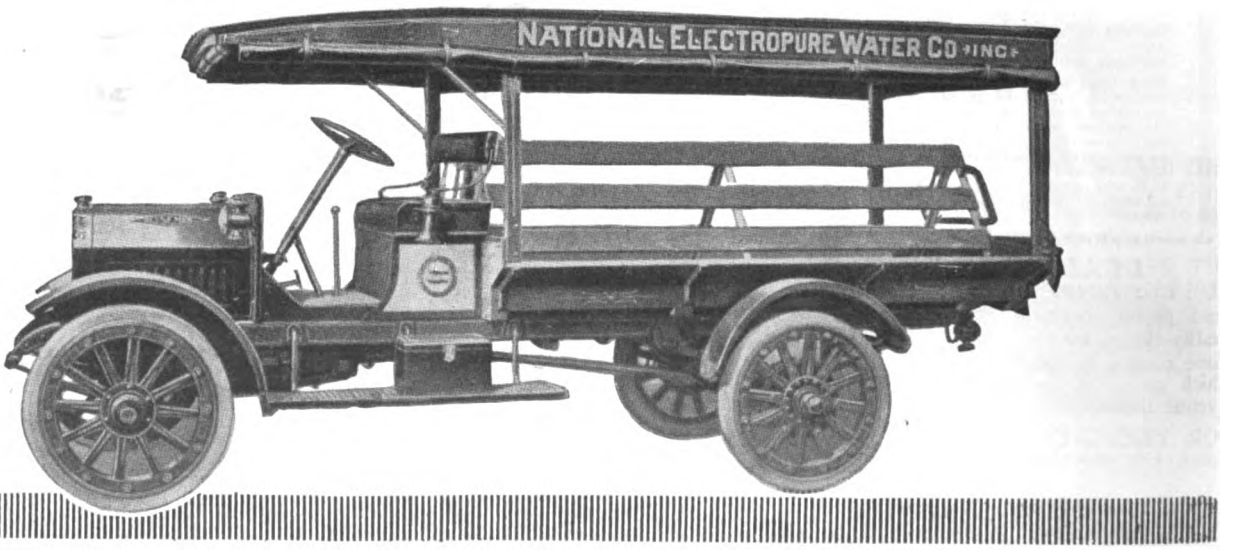
DEALERS—Write us NOW for our liberal selling plans. We give interested factory co-operation and enterprising aid to our dealers.

All Other Inquiries to

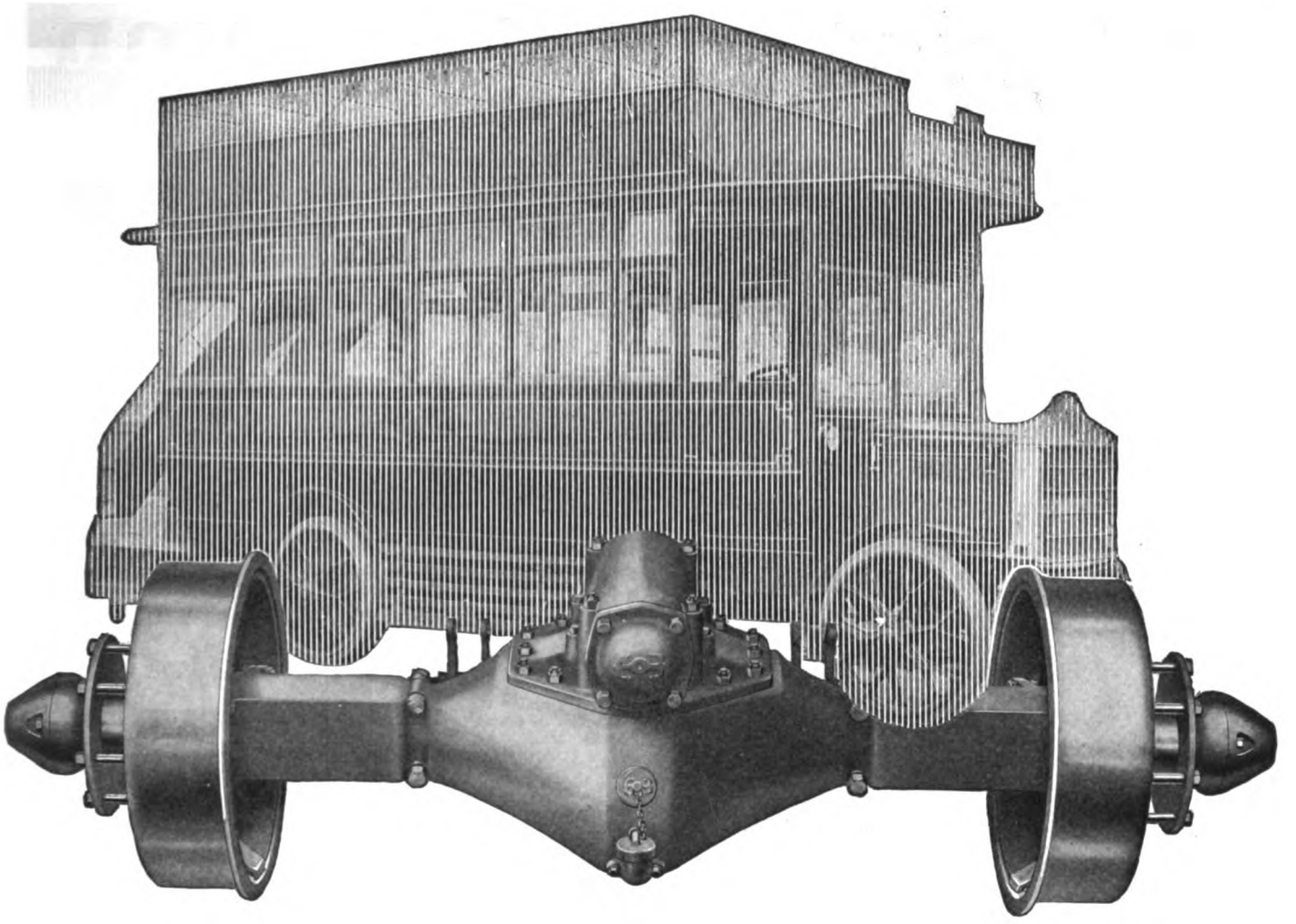
Bessemer Motor Truck Company **Grove City, Pa.**

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y,
Distributors for Western New York State



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If Cost Had Been the Only Consideration

The Fifth Avenue Coach Company Never Would Have Adopted

SHELDON

Worm Drive Rear Axles

THE FIFTH AVENUE COACH COMPANY of New York could buy any other type of drive and any other make of worm gear axle cheaper than SHELDON.

BUT OPERATING THE FIFTH AVENUE BUS LINES is very much of a dividend paying business proposition. Mere quality claims are discounted. Performance alone counts in the selection of the units which go to make up the famous Fifth Avenue Buses.

FOR YEARS PAST the Fifth Avenue Coach Company have been trying out in actual service virtually all different makes of axles with a view of ultimately selecting for standard equipment the axle which showed the lowest-cost-per-mile haulage.

SO, EACH DAY accurate cost records were tabulated. Fuel consumption, oil consumption, tire mileage, maintenance costs and replacement charges were accurately figured each day. The sum total of these records now gives indisputable evidence of the superiority and lower-service-cost of SHELDON axles and in the future all Fifth Avenue Buses will be SHELDON equipped.

THIS EXHAUSTIVE ELIMINATION test should prove of invaluable aid to every prospective truck buyer in helping him in his final selection of a truck, for it places at his disposal the results of accurate cost records which would take him years to personally compile.

ANY TRUCK DEPENDS for its final efficiency on its rear axle. Be guided by the experiences of a firm who really knows. Write for a copy of the report made by The Fifth Avenue Coach Company of what they learned after their two-year elimination test.

SHELDON AXLE and SPRING COMPANY

Makers of Springs and Axles for Heavy Duty Service for over Fifty Years

Wilkes-Barre - - - - - - - - Penna.

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In the Steering Column



The illustration shows the application of Bound Brook Oil-less Bushings as used in all Jacox Steering Columns, manufactured by the Jackson-Church-Wilcox.

BOUND BROOK

TRADE MARK REG. U. S. PAT. OFF.

THE use of plain ordinary bronze bushings in the steering column simply means that the owner must never forget to keep the bushings well lubricated.

For neglect here would mean quick bushing wear, a stubborn wheel to turn and the ever present possibility of the bushings gripping or sticking with disastrous results to the driver.

But with BOUND BROOK (*Graphite and Bronze*) Oil-less Bushings in the steering column there is positive and lasting assurance of a smoothly efficient, quick, easy turning column, *even though you neglect the bushings.*

BOUND BROOK (*Oil-less*) Bushings are self-lubricating. They contain within themselves sufficient lubrication to last their life-time. You need never worry about them. They need no attention to give efficient service.

BOUND BROOK (*Oil-less*) Bushings are used instead of ordinary bushings in bearing places about automobiles and trucks that are difficult or impossible to keep properly lubricated.

BOUND BROOK OIL-LESS BEARING COMPANY

Specialists in the manufacture of Oil-less Bushings for more than a third of a century

BOUND BROOK, NEW JERSEY

Manufacturers of Nigrum (Impregnated Wood) Oil-less Bushings.

All Genuine Graphited Oil-less Bushings have always been made at Bound Brook, U. S. A.

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U. S. Army Ambulance Body Mounted on Selden Chassis

In army ambulance service a motor truck must be dependable. It must be capable of performing its duty against odds without hesitation—quickly—with absolute certainty.

SELDEN TRUCKS

are dependable to the last degree. Their powerful construction—"IN-BUILT QUALITY"—furnishes them with the vital force to perform with little or no attention, at a minimum upkeep cost, the most severe task to which a motor truck can be put.

Selden Trucks are rendering profitable service in every kind of business. Concerns like the Coca-Cola Co., National Biscuit Co. and Knabe & Son, for instance, use Selden Trucks.

Dealers: Selden Agencies are now pretty well distributed throughout the country. Dealers have been quick to recognize the opportunity offered by the Selden Line. Some territory is still open however. It may be yours. Write for application blank at once.

Selden Truck Sales Co.

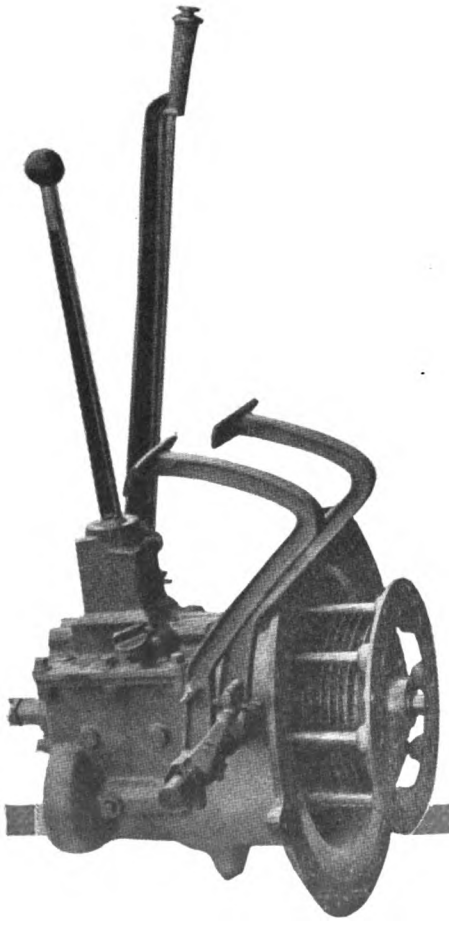
Rochester, N. Y., U. S. A.

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TRUCK TRANSMISSIONS

Very Little Power Is "Lost in Transmission" When Your Truck Is Fuller-Equipped

FULLER-TRANSMISSIONS



Truck Owners **pay** for faults in construction. **Everything** makes a difference in trucks—**a real difference, a difference in time, expense,** cost of delivery.

The Truck Manufacturers who are building an actual, **lasting** success—a deserved reputation for their trucks—are those who recognize this fact and direct their actions accordingly.

That leading Truck Manufacturers continue year after year to install Fuller Transmissions is the strongest indication that they have found those Transmissions Efficient, Economical, Dependable.

Fuller & Sons Mfg. Co.
Kalamazoo, Michigan

Eastern Representatives
Earle & Boggs **1790 Broadway, New York**



PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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FACTS

Why Your Success is Assured

FACTS—Facts only—sell the business man of today.

He demands Facts that are incontrovertible;—they form the ***only*** argument that will impress him.

No facts are so evident, so unquestionable, as Facts embodied in a mechanism of cold steel. No argument is so persuasive as a statement of a recorded performance.

Facts which prove themselves are inherent in Gramm-Bernstein Trucks. Back of these trucks is an international reputation for quality, absolutely unequalled. Back of them, too, are brains, sixteen years of truck building experience, and excellent manufacturing facilities—the name itself is a powerful argument for the Gramm-Bernstein Motor Trucks.

The Gramm-Bernstein line is complete, comprising 1, 1½, 2½, 3½, 5 and 6 ton trucks. A Gramm-Bernstein agent is ready to meet the demand of the small retailer as well as that of the great contractor—to sell one truck, or a fleet of trucks.

Strength, Power, Economy, Simiplicity, Surety of Operation, Continuous Service—these are facts which in Gramm-Bernstein Motor Trucks are expressed in mechanical units, each proving its own superiority. These are facts which have won for the Gramm-Bernstein line international recognition as the world's best in motor trucks.

Gramm-Bernstein transmissions and control are not only simple—they are positively trouble and error-proof.

Facts such as these are present in Gramm-Bernstein Trucks—trucks which bring profit to the dealer.

Because of the Gramm-Bernstein sales policy, the most generous, most profitable sales policy ever put up to any ambitious man or firm and—

Because Gramm-Bernstein complete line (1 to 6 tons), trucks upheld by a reputation which in turn they fully uphold, are easy to sell, for they virtually sell themselves.

Pioneers for 16 Years

The Gramm-Bernstein Motor Truck Company

Lima, Ohio U. S. A.

GRAMM BERNSTEIN

THE GRAMM-BERNSTEIN MOTOR TRUCK COMPANY—LIMA-OHIO-U.S.A.

MANUFACTURERS OF HIGH GRADE WORM DRIVE MOTOR TRUCKS—1-1½-2-2½-3½-5-6 TONS

The Gramm-Bernstein Motor Truck Company, 13 Gramm Boulevard Lima, Ohio, U. S. A.

Please send me complete explanation of your new sales policy on Gramm-Bernstein Trucks, including reasons why it will pay me to handle the line; the advertising you will do for me in my local papers; the Dealer Sales Service, etc.

Name .....

.....

Street and Number.....

City..... State.....

I (am / am not) representing a truck at the present time.

If you are representing a truck at present, please give the name of it here.

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Stand Behind the Men Behind the Guns

BUY
A Liberty Loan Bond
AND
HELP WIN THE WAR

Interest 3½%

Issued by the United States Government

Denominations—$50, $100, $500, $1,000, $5,000, $10,000, $50,000 and $100,000. First payment as low as one dollar. You have until August 30, 1917, to pay in full for your bonds. **Ask any Banker, Postmaster, Express Company or Merchant** for an Official Application Blank and

Apply for Your Liberty Loan Bond Today!

A Tribute to the Flag and the Safest Investment in the World

"Wars cannot be conducted without money. It is the first thing to be provided. In this war it is the most immediate help—the most effective help that we can give. We must not be content with a subscription of two billion dollars—we must oversubscribe this loan as an indication that America is stirred to the depths and aroused to the summit of her greatness in the cause of freedom. Let us not endanger success by complacent optimism. Let us not satisfy ourselves with the reflection that some one else will subscribe the required amount. Let every man and woman in the land make it his or her business to subscribe to the Liberty Loan immediately, and if they cannot subscribe themselves, let them induce somebody else to subscribe. Provide the Government with the funds indispensably needed for the conduct of the war and give notice to the enemies of the United States that we have billions to sacrifice in the cause of Liberty.

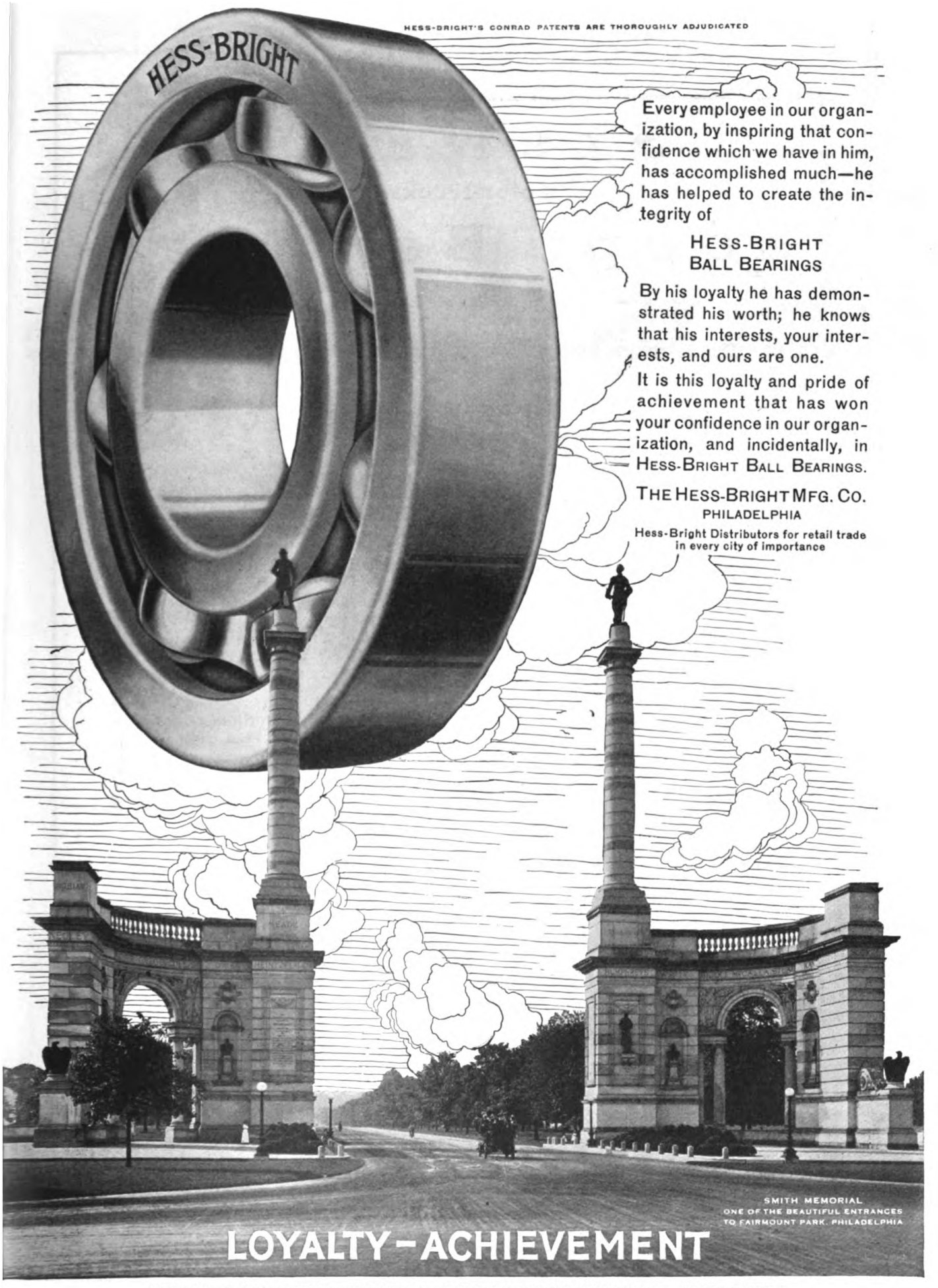
"Buy a Liberty Bond today; do not put it off until tomorrow. Every dollar provided quickly and expended wisely will shorten the war and save human life."

—Secretary W. G. McAdoo, May 14, 1917.

A Liberty Loan Bond Is Uncle Sam's Promise To Pay and He Is Worth $225,000,000,000

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HESS-BRIGHT'S CONRAD PATENTS ARE THOROUGHLY ADJUDICATED



Every employee in our organization, by inspiring that confidence which we have in him, has accomplished much—he has helped to create the integrity of

HESS-BRIGHT
BALL BEARINGS

By his loyalty he has demonstrated his worth; he knows that his interests, your interests, and ours are one.

It is this loyalty and pride of achievement that has won your confidence in our organization, and incidentally, in HESS-BRIGHT BALL BEARINGS.

THE HESS-BRIGHT MFG. CO.
PHILADELPHIA

Hess-Bright Distributors for retail trade in every city of importance

SMITH MEMORIAL
ONE OF THE BEAUTIFUL ENTRANCES TO FAIRMOUNT PARK, PHILADELPHIA

LOYALTY-ACHIEVEMENT

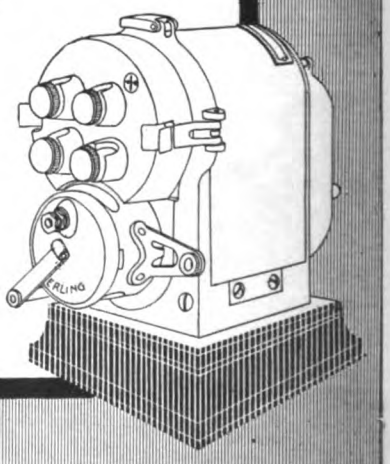
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Stewart
motor-trucks
adopt Berling

Stewart sales jumped $1,000,000 in the last 12 months. That tells how good the Stewart truck actually is—for this is the 5th year and in 5 years no Stewart has ever worn out. When motor-trucks last like that there is only one reason—they were built right. The right units were selected on the basis of permanent quality rather than on price.

On that same basis, the worth-more-does-more Berling magneto has been chosen to insure the Stewart's ignition.

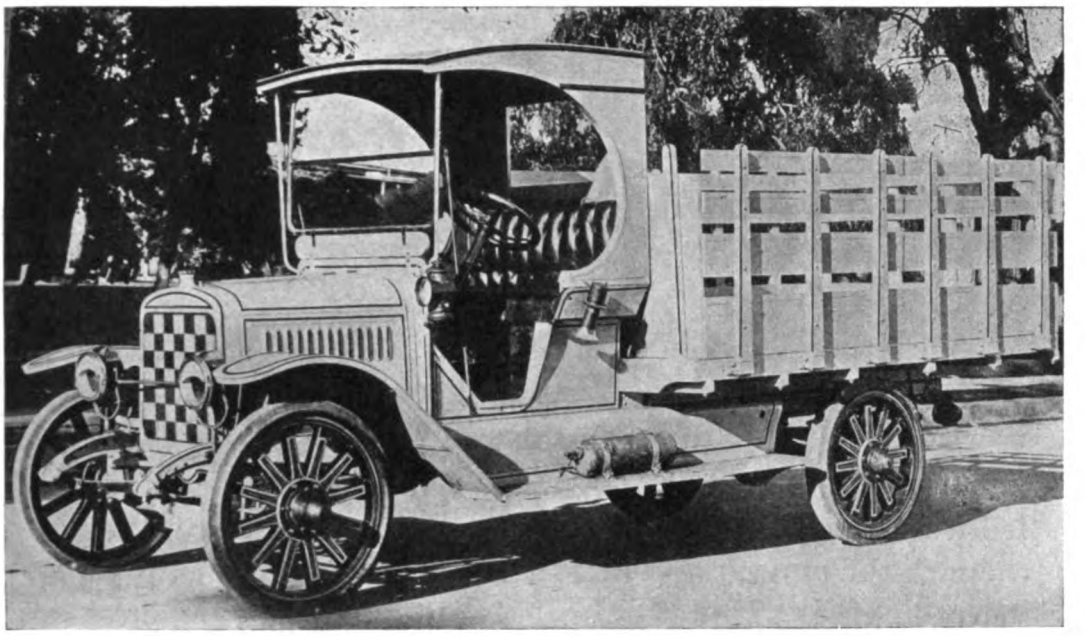
The New E-41 Berling for Trucks



Ericsson Manufacturing Co.
Military Road, Buffalo, N.Y

Berling Magneto
WORTH MORE DOES MORE

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KISSELKAR TRUCKS

The final choice of purchasing experts in over 200 different lines of business.

The matchless Kissel-built motor, and perfected worm drive rear axle, are guaranteed with every KisselKar Truck.

Five sizes from the Light Delivery up. Chassis prices $1085 to $3750.

KisselKar Truck branches, display rooms and service stations in all principal cities and towns.

DEPENDABILITY IS WHAT TRUCK OWNERS DEMAND IN THE TRUCKS THEY BUY.

And truck **dependability** is possible **only** with reliable frame, axles, springs, brakes, motor and other structural parts.

The Kissel-built engine is **power-insurance** for every grade—the perfected worm drive rear axle is **traction insurance** on every road, while the other Kissel mechanical superiorities and features are **performance insurance** under all road conditions. More KisselKar Trucks are now being used in **every line** of **business** than ever before. Let us send you data and information on how they are making good for **other owners** in **your line** of business.

Dealers—A KisselKar Truck Agency in unoccupied territory is an investment—a dividend producer of the first magnitude. Investigate.

KISSEL MOTOR CAR CO., Hartford, Wis., U. S. A.

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The COMMERCIAL VEHICLE

THE editorial policy of COMMERCIAL VEHICLE interests the truck owner by keeping him advised of all new developments in the quest for the ultimate lowest-ton-mile-haulage.

It interests the Truck and Accessory Dealers by advising them of the newest and most valuable way and means for increasing sales and efficiently managing their business.

READERS

5,000 (plus) interested readers subscribers—read COMMERCIAL VEHICLE twice every month.

Most of them are just as much interested in the advertisements as in the editorial matter.

Truck Owners, Truck Dealers, Truck Salesmen, Truck Accessory Dealers and Jobbers are buying and reading it—more of them every issue.

CIRCULATION

This circulation is guaranteed—you **know** that the very people you want to reach will read your story. You have practically 100% of actual prospects.

COMMERCIAL VEHICLE is definitely and permanently established with the trade and offers a medium to advertisers in this particular field that is unexcelled.

It offers a dollar-for-dollar value that is extremely attractive to advertisers

The COMMERCIAL VEHICLE

239 West 39th Street New York

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Sells without demonstration ATTERBURY

MR. Vees, of the Philadelphia Atterbury agency, so oversold that he had no Atterbury on hand. And yet—with nothing more than pictures and specifications, he actually sold two Atterburys to export buyers. The Atterbury's quality is obvious. Would you like to sell that kind of a truck? Your territory may be open for a dealer-proposition.

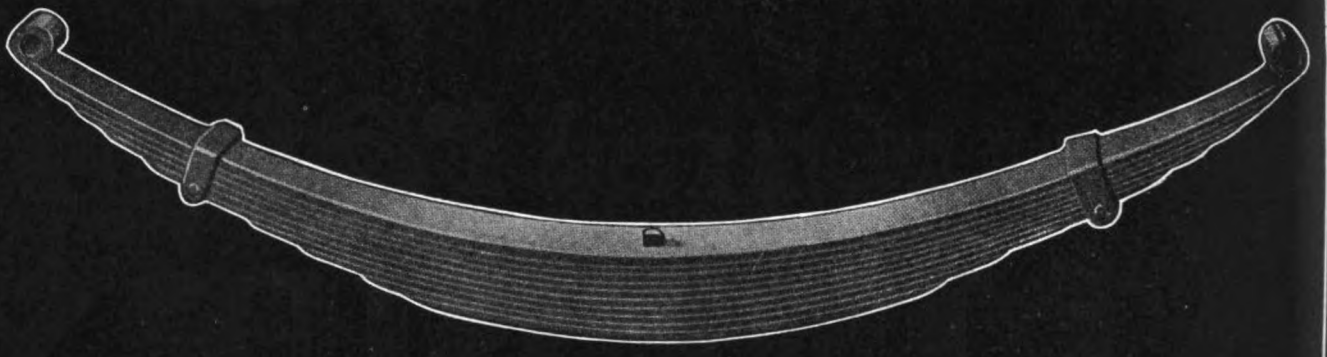
Atterbury Motor Car Co.
Buffalo, N. Y.



MOTOR TRUCKS OF ATTERBURY MAXIMUM SERVICE

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"The Spring Is the Thing"



MATHER

Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

Minimum of Vibration

Genuine made only by

The Mather Spring Company

Toledo, Ohio

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Russel

Internal Gear Drive Axles



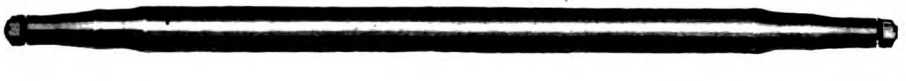
The Russel Internal Gear Drive Axle has retained and improved all the good features of the chain drive, and has eliminated all the bad ones.

The chain d ive, when new, is the most efficient drive for moto trucks. But it soon loses its efficiency, as the chains yield, wear rapidly and become noisy.

Large manufacturing experience is back o Russel design and workmanship. We have supplied more manufacturers of 1 and 2 ton trucks with jackshafts than any other axle maker.

Russel Motor Axle Company
North Detroit

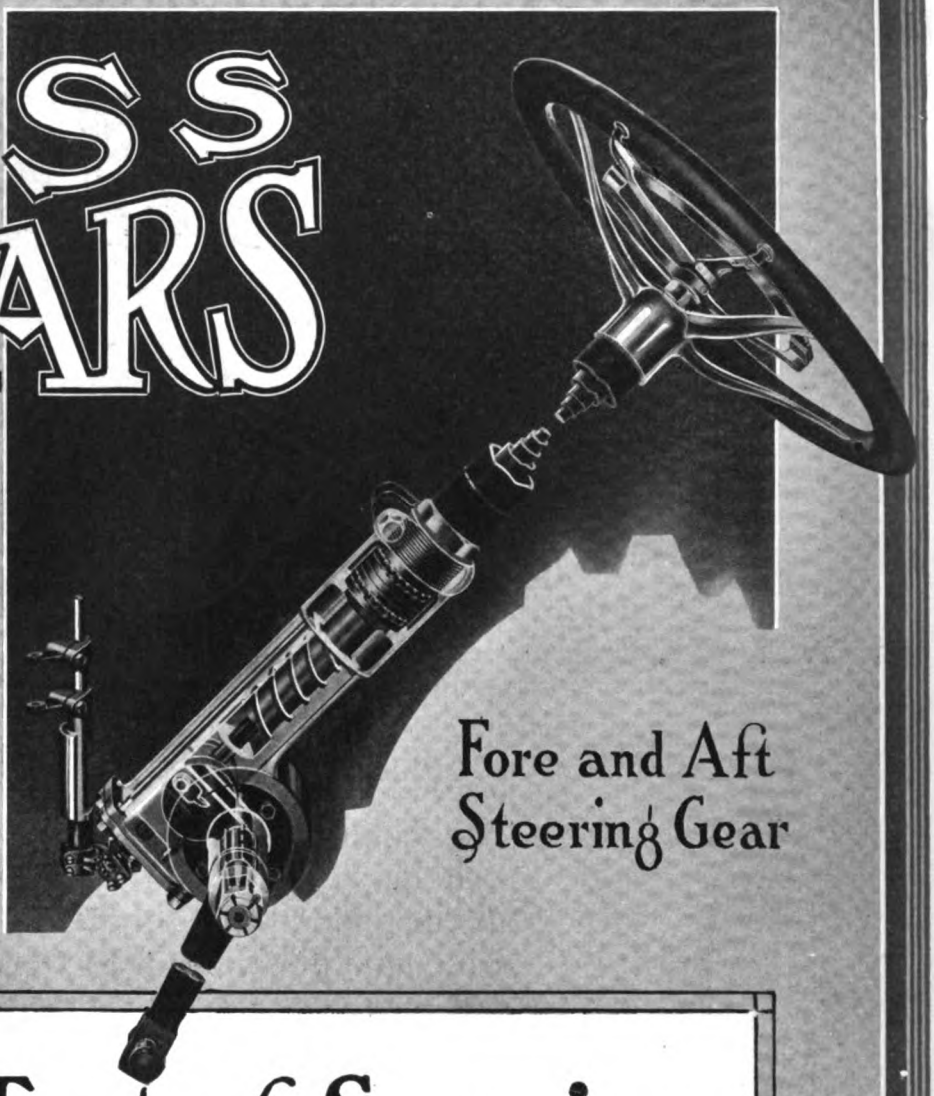
The Russel Load Carrying Axle is a one-piece round bar of chrome-nickel steel



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ROSS GEARS

"The Steering Gears that Predominate on Motor Trucks"



Fore and Aft Steering Gear

The Test of Service

Ten years of successful performance have so thoroughly demonstrated the superiority of Ross Steering Gears that they are accepted as standard equipment, and are now in use on one hundred and twenty-one different makes of motor trucks.

Their perfection of design makes them wonderfully easy to operate, with the highest degree of safety and reliability, while the quality of the materials used and the excellence of workmanship insure long life and service.

If you are interested in steering gears that will measure up to these standards, that will do their work satisfactorily and successfully, write for our catalog and any specific information you may desire.

THE ROSS GEAR & TOOL CO.
750 Heath Street Lafayette, Indiana

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The COMMERCIAL VEHICLE
Read by Business Men

Published on the first and 15th of every month
Entered as second-class matter, September 13, 1906, at the Post Office, New York, N. Y., under Act of Congress, March 3, 1879

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The Commercial Vehicle, Inc.

239 west Thirty-ninth street
New York City

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Charles W. Blackman, Vice-Pres. & Gen. Mgr.
E. M. Corey, Sec. & Treas.

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BRANCH OFFICES
Chicago, Mallers Building, 59 east Madison street
Detroit, 95 Fort street west Cleveland, 516 Swetland Building

SUBSCRIPTION RATES
United States .....$2.00 per year
Canada ..... 3.00 per year
Foreign Countries ..... 4.00 per year

ADVERTISEMENTS
Changes in copy for advertisements in the next issue to be in the office of publication not later than 10 days before date of publication

WYMAN-GORDON



The Men Back of the Product—

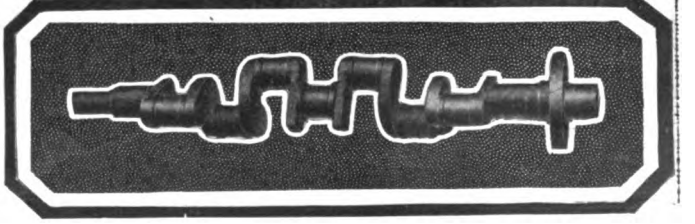
WYMAN-GORDON DROP FORGINGS do not owe their unusually high character alone to specially designed machines, rigid rules, and unerring tests for accuracy.

THERE IS A STRONG HUMAN element behind drop-forging pre-eminence. Some of the fine points of this art are unlearnable by others than those naturally adapted to the work.

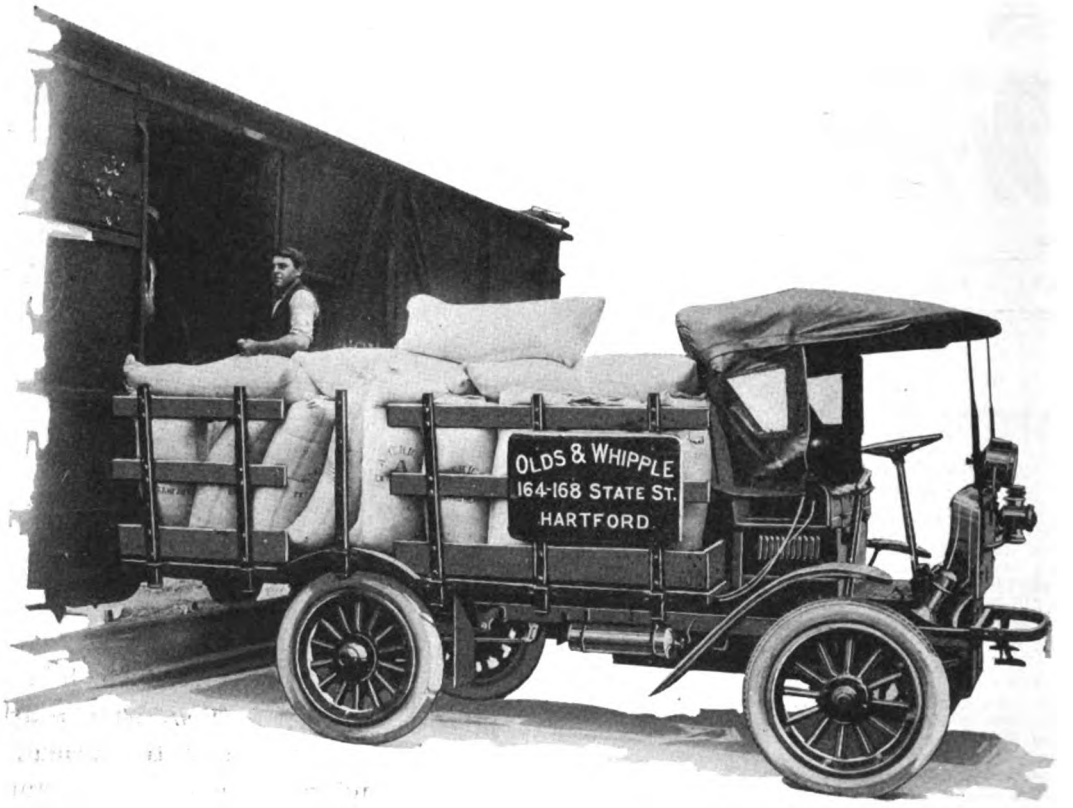
THE WYMAN-GORDON GUARANTEE rests surely and solidly, not only on extraordinary precaution against mishaps, but to a larger degree upon the remarkably fine workmanship of our skilled employees, who are acutally masters of their craft.

WYMAN-GORDON CO.
Worcester, Mass. *Cleveland, O.*

Guaranteed Forgings



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Endorse Autocar After Six Years' Use

Olds & Whipple of 164 State Street, Hartford, Conn., say: "We have been using Autocars for the last six years and are well satisfied with results, as we are getting good mileage on tires, also gasoline consumption, and can recommend same as having plenty of power and speed for a truck."

Write for illustrated catalog and list of more than 4500 concerns using Autocars in every line of business

THE AUTOCAR COMPANY

ARDMORE, PA.

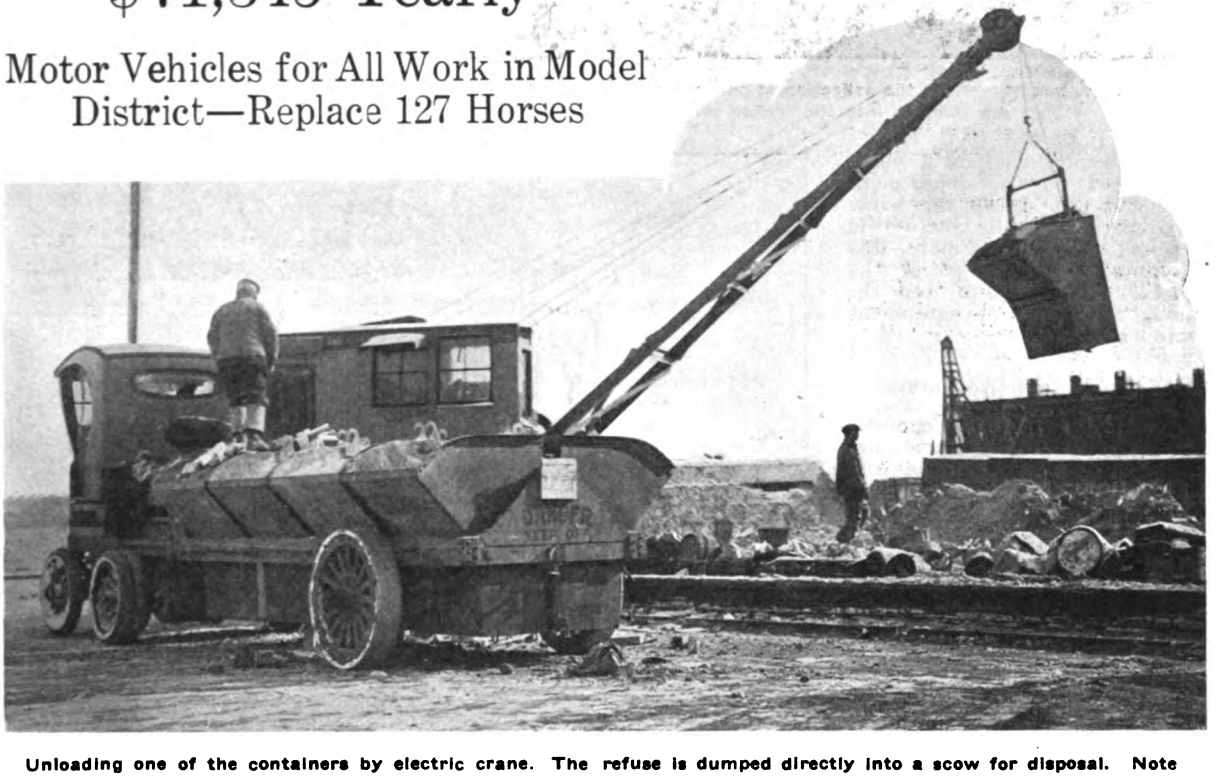
Established 1897 MOTOR DELIVERY CAR SPECIALISTS

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI June 1, 1917 No. 9

Gotham's Fleet of Municipal Gas-electrics Saves $71,345 Yearly

Motor Vehicles for All Work in Model District—Replace 127 Horses



Unloading one of the containers by electric crane. The refuse is dumped directly into a scow for disposal. Note the unusual shape of the container and the trailer in which they are carried

THIS is a story of truck costs. It is a story of the ascendency of motors over animals in the collection of garbage, ashes and refuse in a great city. It tells how the motorized equipment in a model district of New York City has reduced the cost per ton collected from 24.3 cents to 16.2 cents, a reduction of approximately 8 cents or 33 per cent. This small saving represents a yearly reduction in the cost of collection of $71,345 effected by the equipment which besides renders a service in many ways superior to that formerly performed by horses.

Cost Figures on Standard Basis

Furthermore the cost figures have been reduced to the basis of THE COMMERCIAL VEHICLE Standard Cost System for Motor Trucks so that all individual owners of trucks or municipalities using this system may compare their costs with those of Gotham's municipal equipment on the same basis and without fear of having left out important items or included those which should not be charged against the vehicular equipment.

While the reduction of cost and the saving effected thereby are the most important advantages, there are others of perhaps equal importance to the citizen who must pay the bills in the way of taxes and whose refuse must be removed from in front of his house.

Among these additional advantages are the greater rapidity of collection of both garbage and ashes, especially the former, and the street refuse. In summer the city's health is conserved by the collection of garbage before it has decomposed to such an extent as to become dangerous to the public health. Similarly the tractors eliminate the refuse of 127 horses which otherwise would have to be swept from the streets daily. Again, the tractors take up 40 per cent less space than do the horses, their wagons, harness and feed. The significance of this item, which might otherwise be considered trifling, is recognized when the department stable at which the tractors are garaged is valued at $1,150,000. Forty per cent of this amount means the turning over of land valued at $460,000 to other purposes.

Other Motor Advantages

The reduction of manual labor from 370 men as required in the horse system to 237 as in the motor, a clear saving of 133 men, is no mean reduction in this time of war when the man power of our nation is needed for the great conflict to which we have pledged ourselves. Perhaps of equal moment with the most important advantages of the motor over the animal system is the fact that the same motor vehicles can be used for the collection of ashes, garbage, paper and refuse at the same time instead of having three separate and distinct types of equipment as with the old horse procedure. Again, the use of the tractor as the locomotive means for snow plowing and sweeping eliminates two other

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One of the G. V. tractors at work in the collection of garbage and ashes. Note how the cans are dumped into the trailer containers

types of street cleaning equipment which formerly cluttered up the department yards when not in use. In all, this horse equipment replaced by the motors is valued at $68,473.25. Furthermore, this replaced equipment depreciated at the rate of $1,129.80 per month and the average annual interest on the equipment replaced was $3,081.31.

Speed Important Motor Advantage

The most important duty of a municipal cleaning department is prompt and rapid disposition of street, trade and household refuse. This is especially important to a city like New York which is thickly populated. Tardy disposition of this refuse will imperil the health of the city. This thought and the idea of improvement have been constantly in the mind of John T. Fetherston, Commissioner of New York's Street Cleaning Department. And because of this being to the fore New York may rightly boast of being the first city in the United States to install a fleet of motor vehicles for refuse collection and snow fighting.

Why Gas-electrics Were Bought

Before the Department bought its fleet of twelve tractors considerable time was spent in trying out different kinds of tractor-and-trailer combinations capable of doing at least from 16 to 20 hours of continuous work collecting refuse or hauling mechanical sweepers and flushers. The experience thus gained showed that gasoline-electric tractors as designed by the General Vehicle Company, Inc., were not only the most suitable because of their simplicity, and especially because trained drivers were not needed to operate them, but because they could be maintained and operated most economically.

To accomplish the same amount of work, experiments showed that the gas-electric type could be maintained and operated at an annual cost of $5,815.46 each, while the lowest cost for a gasoline system was $6,339.74 and $7,296.76 for a conventional electric with its storage battery.

The tractors are used in connection with special trailers designed by the Technical Staff of the Street Cleaning Department with the specific purpose of making a joint collection of ashes, garbage and rubbish and yet keeping the materials separated. Therefore each trailer is provided with eight removable ash and garbage containers and two for rubbish. The former are arranged in two longitudinal rows, four on each side of the trailer. The latter have V-shaped bottoms. Each serves as a cover over four ash and garbage containers. The openings of the ash and garbage containers are self-closing, thus preventing dust and some of the obnoxious odors from escaping. These trailers carry anywhere from 15,000 to 30,000 pounds.

Put to Work Late in 1915

On September 8, 1915, this fleet was placed in operation in what is known as Model District No. 6. This district is very typical in that one can find retail and business houses of all kinds, residences, tenements, hotels, manufacturing plants, small apartment houses, public institutions, etc., within its borders. Further, it has a population of 130,000, an area of 900 acres, a street mileage of 50 and 807,555 sq. yd. of pavement.

MONTHLY TRUCK

Year

Month ending January 1917

Make of truck General Vehicle ~~Gasoline~~ ~~Electric~~

THE COMMERCIAL VEHICLE—TRUCK COST SYSTEM Gas-Electric Tractors + Trailers

Operating Charges

Gasoline 77,356½ gals.	@ 24¢	$18565.56	
Current ____ kw-h.	@		
	@		
Oil ____ qts.	@		
Grease ____ lbs.	@ .036 per mile	2490.67	
Kerosene ____ gals.	@		
Waste ____ lbs.	@		
Dist. water ____ gals.	@		
	@		
	@		
Driver (25) ____ wages	@ $900 per year	22500 00	
Helper Mechanics Helpers (4) ____ days	@ $900 per year	3600 00	
Foreman (2)	@		
Mechanic ____ hour	@ $1800 per year	3600 00	
A—Total operating charges		50756.23	$50,756.23

Maintenance Charges

*Tires ____ miles	@	$	
Repairs	.039 per mile	2698.22	
Overhauling, painting, etc.			
Spare vehicle rental			
Garage rental (pro rata)			
B—Total maintenance charges		2698.22	$53,454.45

Fixed Charges

Insurance, fire @ 1½ %	per year	$ 1745 79	
Liability @ $ 125	per year	2375 00	
Collision @ 2¼ %	per year + 25% of Rem.	3223 17	
Interest @ 6 %	(On hum + ½)	6445 34	
Depreciation on chassis @ 20 %		16928 40	
Depreciation on body @ 33⅓ %		3301 66	
Depreciation on equipment @ 50 %		3026 00	
*Depreciation on tires @ 45⅝ %		3112 20	
Total taxes and licenses			
C—Total fixed charges		40157.56	$ 93,612.01

*Note: Omit one of these.

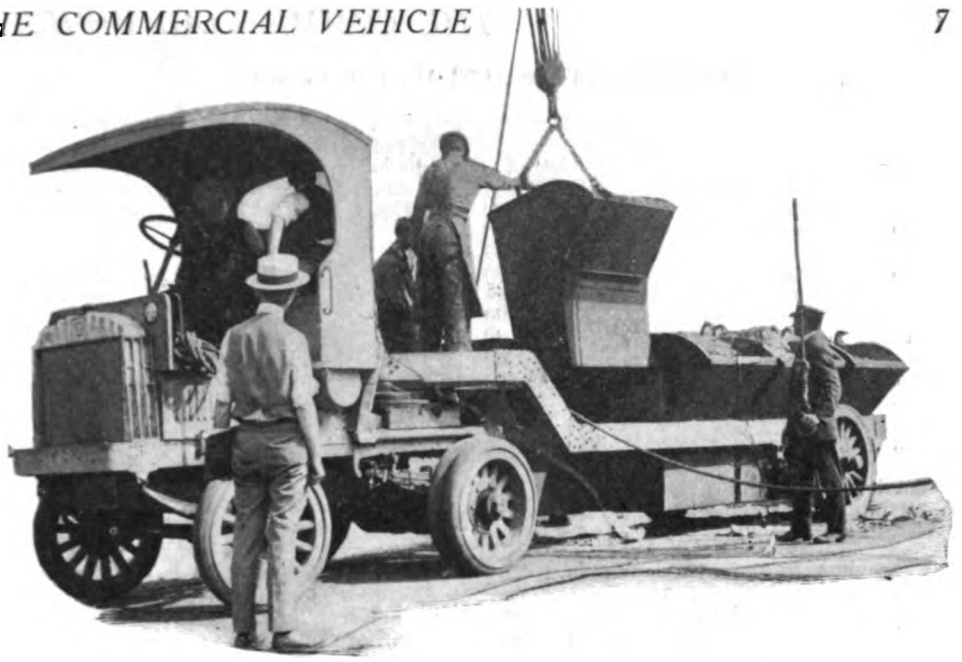
The cost figures for the municipal gas-electrics for the year 1916 reduced to THE items are included except that for garaging. At an estimated charge of $1 per tractor increased the cost per commercial ton.

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When the motor vehicles were installed in that district nearly every feature of the new system was strange to the men. And to train a force of officers and men to properly operate the various apparatus was no small task for Commissioner Fetherston and District Superintendent T. J. Reilly. Therefore, to meet this new condition experienced men and engineers were placed in charge of every detail. In fact, a new department of instruction was created in the Street Cleaning School. There the men were thoroughly schooled before they were given charge of a tractor or the like. But in spite of these early difficulties, the new system has been a success from the very start.

Day's Routine

The tractor drivers and crew report for duty at either 4 a. m. or 2 p. m., as they work in two shifts of 8 hours each. After roll-call, a driver, crew of five loaders and a tractor are assigned to a particular section of the district which they must finish as their day's work. Now the reason the tractors start out at 4 a. m. is to enable them to cover the streets to which traffic is very heavy during the day. And those streets which are left over are cared for in the evening, as the tractors work until 10 p. m. By operating the tractors in this fashion they do not interfere with the ordinary traffic because during the busy hours of the day they confine their operations to the less traversed streets.



One of the containers being lifted bodily out of the trailer by the electric crane. Note the container construction and the trailer gooseneck

COST SUMMARY

Number of trucks A 19

Capacity in lbs. 20,000 Chassis No. 1 to 19

THE COMMERCIAL VEHICLE—TRUCK COST SYSTEM

Investment	
Cost of chassis, less tires	$8,164.00
Cost of body Trailers	9,905.00
Cost of equipment such as Containers etc	6,052.00
Cost of tires	6,840.00
1—Total cost, complete	$31,439.00
Performance Record	
2—Days operated	3528
3—Days idle	1489
4—Days maintained (Item 2+Item 3)	5017
5—Total hours operated	48000
6—Total miles covered	69185.1
7—Total trips made	17583
8—Total tons cu.-packages-or-stops	148,115.65
Performance Averages	
9—Average miles per day maintained (Item 6÷Item 4)	13.7
10—Average miles per day operated (Item 6÷Item 2)	19.6
11—Average miles per trip (Item 6÷Item 7)	3.9
12—Average tons, stops-or-packages per trip (Item 8÷Item 7)	8.41
13—Average commercial ton-miles, package-miles-or-stop-miles per trip (Item 11×Item 12)	32.80
Recapitulation	
14—Total expenses for year month (Sum of Items A, B and C)	$9361.01
15—Cost per day operated (Item 14÷Item 2)	26.53
16—Cost per day maintained (Item 14÷Item 4)	18.65
17—Cost per mile operated (Item 14÷Item 6)	1.353
18—Total commercial ton-miles, package-miles-or-stop-miles (Item 7×Item 13)	576,704.82
19—Cost per commercial ton-mile, package-mile-or-stop-mile (Item 14÷Item 18)	$ 0.162

COMMERCIAL VEHICLE Standard Cost System for Motor Trucks. Note that all per day, the cost for the period covered would have been $5,017. This would have mile to 17.1 cents instead of 16.2 cents

How the Trailers Are Loaded

Once in their assigned section, one of the loaders climbs on top of the rubbish containers. He aids the others as they toss things to him. The remaining four loaders split up into squads of two, each taking one side of the street. One loader, on each side of the street, works in advance of the other. That is, he rolls the cans from in front of the building to the curb. This done he awaits the tractor and then aids the other loader in lifting the cans onto the trailer, leaving the other loader to return the cans to their proper place, while he moves on to the next stop. Two to six cans are lifted at each stop, and 60 to 100 stops are made in an hour.

When the containers are filled the tractor returns to the unloading pier, also the location of the garage, at Nineteenth Street and the East River. Four electric locomotive cranes, which receive their power through a contact rail, unload the contents of the containers into large scows which are lined up against the pier. The first crane lifts the two rubbish containers from the trailer. Their contents are dumped into the scow, while the tractor moves on to the ash crane. These emptied, it drives to the end of the pier, turns around and drives up to the garbage crane which is located on the opposite side of the pier. When the garbage is unloaded the tractor returns for the rubbish containers. With two men, a craneman and loader, who also drives the tractor, these containers are emptied and replaced in about 12 minutes.

The city's method of keeping a record of this new system is very interesting. To begin, when the tractor leaves the garage, an entry is made on the "Daily Report of Tractor Operation" sheet as to its number, gas gage and odometer readings, driver's name, time he left, where he is going to and the name of

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WHAT TRACTORS ACTUALLY REPLACED

Number	Equipment	Cost of Equipment	Average Life in Years	Percentage of Depreciation per Year	Average Amount of Depreciation per Month
127	Horses	$43,180.00	4½	22 2-9	$799.63
90	Ash carts	11,079.00	10	10	92.43
14	Paper carts	1,722.00	6	16⅔	24.00
8	Ash trucks	3,000.00	10	10	25.00
155	Collars	736.25	3	33⅓	20.45
84	Cart harnesses	1,932.00	3	33⅓	53.67
16	Double truck harnesses	688.00	3	33⅓	19.11
5	Single truck harnesses	155.00	3	33⅓	4.30
7	Driving harnesses	238.00	3	33⅓	6.61
6	Buggies	2,250.00	8	12½	42.19
8	Machine sweepers	2,376.00	6	16⅔	33.00
3	Machine sprinklers	1,117.50	10	10	9.41
	Totals	$68,473.25			$1,129.80
	Annual interest at 4½%	$3,081.31			

the foreman in that particular locality, also whether or not the trailer is equipped with rubbish containers. On the return of the tractor from the trip, the time, name of the driver, where he was, odometer and gas gage readings are again noted. Then the number of containers of ashes, garbage and rubbish are entered on the sheet. This done, the tractor proceeds to the unloading cranes and upon its return from the end of the pier the time is again noted. Thus the actual time for unloading is ascertained. This is subtracted from the total time of the trip to determine the total time consumed on the route. This completes the history of that particular trip. When the tractor starts on another trip a new entry is made on the sheet, the beginning of the history of the trip.

At the close of the day these sheets are filed with the chief clerk, in the district superintendent's office, for further posting and tabulating purposes. Thus the daily work of each tractor is summarized as to mileage, number of trips, time consumed in loading and unloading, total number of cubic yards of ashes, garbage and rubbish collected, how many hours it worked that day, miles per trip, trips per day, average number of cubic yards of ashes, rubbish and garbage collected per mile, trip and hour, total consumption of gasoline and oil per mile, and the total consumption of fuel for the day. This is entered in an individual tractor record book. At the end of the month these figures are footed and entered on a monthly report sheet which is sent to the Commissioner's Office.

These are not the only records which are kept. Take the drivers for example: They are obliged to report each day to the foreman mechanic any defects which they have noticed on their machines. He then inspects the machine and at once lists it for repairs. As the garage is equipped with a machine, repair and parts department all repairs are made with remarkable speed.

Further, if the driver has an accident, such as running over someone, damaging another vehicle, etc., this he must report to the district superintendent's office at the speediest possible moment. It is then registered, opposite his name, on a special accident report sheet. When he gets back to the pier he makes a detailed report of the accident.

Because the Department has so carefully tabulated all items, it was possible to summarize the results of the tractors as follows in addition to the cost figures given on pages 6 and 7:



Dumping one of the containers, showing the guy rope by which it is tipped

All Tractors for the Year 1916

Total number of days worked	3,528
Total mileage	69,185.1
Total number of trips	17,583
Total time to load, hr.	39,663
Total time to unload, hr.	8,331
Total cu. yd. of ashes collected	165,452
Total cu. yd. of rubbish collected	116,430
Total cu. yd. of garbage collected	16,459
Total consumption of gasoline, gal.	77,356
Total consumption of oil, qt.	23,298

Each Tractor for the Year 1916

Average number of hours worked each day	13.66
Average number of miles per trip	3.9
Average number of trips per day	4.9

Average Amount of Material Collected Per Mile, 1916

Ashes	2.45 cu. yd.
Rubbish	1.67 cu. yd.
Garbage	2.3 cu. yd.

Average Amount of Material Collected Per Trip, 1916

Ashes	9.39 cu. yd.
Rubbish	6.84 cu. yd.
Garbage	0.95 cu. yd.

Average Amount of Material Collected Per Hour, 1916

Ashes	4.19 cu. yd.
Rubbish	2.88 cu. yd.
Garbage	0.39 cu. yd.

Miles Per Gallon of Fuel Consumption

Gasoline	.94
Oil	12.73

How Efficiency Could Be Increased

Greater efficiency may be had with these tractors if the men would not leave their work in order to satisfy their curiosity as to the reason for some excitement on the street. Second, the drivers could save about 10 per cent in time if they would plan their routes more carefully, instead of zig-zagging as they sometimes do. Third, considerable time could be saved in unloading the tractors if they were operated on a schedule so that they did not return to the pier in bunches of two or three. This bunching causes considerable loss of time in waiting for the other tractors which are ahead to get out of the way. And lastly, a few minutes could be saved if three men, instead of two, were employed in unloading. Then the loader would not have to climb from the top of the containers to the driver's cab each time he wanted to move the outfit from crane to crane.

Yet in spite of the foregoing criticism these tractors have been so successful that another district is to be motorized within the course of a few months.

Brief Outline of Tractors

As described in the October 1, 1915, issue of THE COMMERCIAL VEHICLE the G. V. tractors are of a special type whose main characteristic is the use of gas-electric drive with a special control means. One of the special features of the unit is the use of a solenoid device connected with a butterfly valve of the gas engine carbureter and the electric circuit which acts so that the speed of the engine is automatically cut in half when there is no load on the generator. This device is sealed and is not under the control of the driver. No clutch is employed, the motor being started at the beginning of the day's work and kept running, its speed being regulated by the solenoid device. No gearset is provided, the change in speed being regulated by an electric controller in the driver's cab which permits of five forward and two reverse speeds.

The gasoline engine is mounted under the floor of the cab and is directly connected to an electric generator at its rear end. The current generated is then carried to two motors supported beneath the frame, aft of the rear axle. These drive through a counter-shaft with spur gears to internal gears mounted on the rear truck wheels.

COST OF OPERATING TRACTORS

Item	Street Cleaning	Refuse Collection	Snow Work	Totals
Operating and maintenance	$186,300	$77,412	$15,688	$279,400
Interest	2,365	5,081	1,059	8,505
Depreciation	998	15,643	439	17,080
Totals	$189,663	$98,136	$17,186	$304,985

COMPARISON OF HORSE AND MOTOR COST

Item	Motorized System	Horse Vehicle System	Decrease
Investment	$253,000	$758,473.75	$505,473.75
ANNUAL EXPENSE			
1. Operation and maintenance	279,400	308,068.00	28,668.00
2. Interest	8,505	34,131.00	25,626.00
3. Depreciation	17,080	34,131.00	17,051.00
Totals	$304,985	$359,327.00	$71,345.00

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Truck Owners Have Great Opportunity in War Haulage as Railroad Ally

Delays Can Be Overcome by Shipping Goods to Points Near Large Centers and Then Hauling by Trucks, Editors Are Told

WASHINGTON, May 25.—Seventeen of the most prominent men in the United States have answered the most important question of modern times. That question is:

"What does this great war mean to me?"

They answered it at a Conference of Business Papers held here in the National Capital to-day. Five members of President Wilson's Cabinet answered the question. Twelve men high up in the councils of the nation and in intimate touch with every detail of the war machinery of the country answered it. And in answering it they have given new understanding to the meaning of the war to the United States.

In answering the question, these seventeen men spoke directly to several million men and women scattered to the four corners of the country. More than 109 separate industries were represented at the conference. There are few channels of human endeavor that are not served by a business paper represented at the conference.

The next three years are going to be strenuous years. This note ran through every address. It is going to be no time for sitting still and hoping; it is going to be a time for action, for preparation and for the execution of every effort that will win this war for democracy.

For it will be won for democracy. Secretary of the Interior Franklin K. Lane put it well when he said: "This is a war of Feudalism plus Science on the one side and Democracy plus Science on the other. The two are irreconcilable. Government by the soldier is not consistent with government by the people. The United States has taught every other nation of the world all they know of democracy. That is why our sympathies are with our allies and why we are in this war to-day.

2½ Years to Understand Democracy

"It has taken America two and one-half years to understand what democracy means. We have required to see the world's greatest war in progress and to feel the menace of the military power of our enemies in order to bring a realization of the ideals for which we must fight.

"If the German military machine should win this war," said Lane, "Germany might demand Canada as an indemnity; then we would live in constant fear that our 3000 miles of border would be invaded."

Coal Shortage a Myth

The war means much to us in the case of fuel and food. "To-day there is no coal famine, no shortage," said Francis S. Peabody, chairman of the Committee on Coal Production of the Council of National Defense. "It is simply a coal panic. There is more coal available than ever, but everybody wants coal at once. They have been unable to get it because of transportation difficulties."

Those who addressed the meeting were:

George Creel, chairman Committee on Public Information.

Francis S. Peabody, chairman Fuel Board, Council of National Defense.

Dr. Pierson, president Iowa State College.

David F. Houston, Secretary of Agriculture.

Franklin K. Lane, Secretary of the Interior.

Newton D. Baker, Secretary of War.

Josephus Daniels, Secretary of the Navy.

William C. Redfield, Secretary of Commerce.

Frank A. Vanderlip, president National City Bank, New York.

William B. Wilson, Secretary of Labor.

Van H. Manning, director United States Bureau of Mines.

Herbert C. Hoover, Food Administrator.

Walter Gifford, director Council of National Defense.

Frank Scott, chairman Munitions Board, Council of National Defense.

Dr. Franklin H. Martin, in charge of Red Cross Work, Council of National Defense.

Howard Elliott, ex-president N. Y., N. H. & H. Railroad, chairman Railroad Executive Committee, Council of National Defense.

George Otis Smith, director United States Geological Survey.

Lewis B. Franklin, Liberty Loan Publicity Bureau.

"The one thought which we must get into our minds," said Frank Scott, chairman of the Munitions Board, "is that we are in the war. The four essentials of the war are (1) men, (2) metal, (3) machinery and (4) money. We have the men and the metal and the machinery and the money. But we have got to organize these in a different way for the war."

The biggest problem before the Government at present, he said, is the building and equipment of some 32 military cities to house 30,000 troops each. These must all be complete between to-day and Sept. 15.

Railroads Are Inadequate

For the transportation of these troops, and of the vast quantities of foodstuffs and industrial products, said Howard Elliott, ex-president of the New York, New Haven & Hartford Railroad, the United States has 250,000 miles of railroad. And connected with this great network there are more than a million and a half stockholders and over two million employees. Yet, despite this tremendous enterprise, the railroads of the country are inadequate in capacity to produce sufficient transportation. They should spend a million a year on improvements.

How Motor Truck Owners Can Help

Elliott brought right home to the motor truck owners one specific way in which they can help win this war. That is by unloading freight cars promptly.

He also pointed out indirectly the great opportunity of the motor truck for short haul traffic in this time of national crisis. Trucks will be allies of the railroads instead of competitors and will help them by relieving them of the unprofitable short-haul work.

Unload Freight Cars Promptly

The great trouble is that cars are not unloaded promptly. In Germany at present cars must be unloaded in 6 hours, he said, whereas at home here demurrage charges do not begin till after a period of 48 hours, and even then they are far too low.

Great Lesson of Thrift

The greatest lesson which this war will teach us, according to both Vanderlip and Lewis B. Franklin, of the Liberty Loan Publicity Bureau, will be the lesson of thrift. Putting our savings of the future in the Liberty Loan will teach us thrift in a way that will never be lost. Every person regularly receiving wages of $10 a week or more should buy a Liberty Bond, said Franklin.

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Business Good But Different

WAR sets up unusual conditions. These are entirely different from the normal progress industrially of a nation. It is natural that when a nation is engaged in war it will have to modify its industries, change its methods and adapt itself to the new conditions. This is largely true of every industry, including that of the motor truck. There will unquestionably be an increased demand for motor trucks, but this demand will be different. Some industries that have been heavy purchasers will be greatly reduced as buying factors. Other industries may now require more trucks. There are other lines of possibilities in which motor trucks have not been used previously, but in which lines they should be used from this date forward. Not only the manufacturer of motor trucks, but the dealers and the consumers must keep in mind that war brings about a different condition of affairs and that it is up to all factors of the industry to sharpen their wits, analyze the changing conditions, and adapt their businesses to those conditions.

In the field of motor trucks there are many respects in which these changing conditions will evidence themselves. It is generally agreed that the present war may run 3 years, or it may run 5. As a country we are in it and will remain in it until the finish. Our war burden will be greater each month and each year. The necessity for motor trucks in greater quantities will increase from month to month. Transportation is the greatest problem calling for a solution to-day. Our railroads are short 150,000 freight cars, and there is little possibility of catching up on this shortage. At the same time the demands for transportation are increasing. Transportation conditions are now different. Building cantonments for our conscription army is equivalent to building thirty-two new cities. For 1,000,000 soldiers it will require accommodation equal to the cities of Buffalo, Syracuse and Rochester. This tremendous problem is supposed to be accomplished between now and Sept. 15. This is one of the examples of different business that comes up because of the war. Thousands of trucks will be needed in this work and these cantonments are going to be located in different sections of the country.

Many other examples of changing business because of the war might be cited. One is worthy of consideration: With 150,000 shortage of railroad freight cars, the time is opportune for the motor truck to step into the breach of developing intercity transportation. Heretofore railroads have looked upon this as rivalry, as an attempt to enter their special field. To-day the railroads cannot look upon it in such a way. They are inadequately fitted themselves to handle the transportation requirements. To-day they will consider the motor truck more of an ally than a rival. To-day the whole country requires more transportation, more railroad transportation, more steamboat transportation, more motor truck transportation, more horse transportation.

Frequently freight cars are detained for days in the confines of great cities due to lack of railroad siding facilities. The motor truck can help out in this matter. It will prove immeasurably quicker and cheaper if the motor truck can be pressed into service and prevent this siding congestion by not attempting to bring all of the railroad cars into the city zone, but keeping them outside and using the speedy motor truck for the transportation into the city.

Take an example: A Detroit manufacturer complained that it required 2 weeks to get a shipment of car parts from an Indiana factory to his own unloading platform. Of these 14 days the freight car waited for 11 days within a few miles of Detroit. It was entirely due to congestion in the Detroit zone that 11 days were lost. It would have been money to that manufacturer to have used motor trucks, which could have been done by having the shipment consigned to some point just outside of Detroit. At least 10 days would have been saved. This example suggests a possibility for the newer use of motor trucks, and is an example of how the business man may have to change to meet the changing conditions brought about because of the war. This is but one more example of how the shifting of industries in these strenuous days must be watched; it is one more example of how business must whet its wits; it is one more example of how these war conditions must be faced with greater mental alertness and with greater physical vigor.

These are war days. These are not days of poor business, but days of changed business. These are days of unusual business. These are days when business demands the battle of brains more than ever before.

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Helping Your Drivers Spells Truck Success

STUDY the characters of your drivers if you want your truck installation to be a success, is the advice of J. V. Finn, who has been delivery superintendent for the Jordan-Marsh department store in Boston, Mass., for the past 18 years.

Finn is a firm believer in the old saying that, while you may lead a horse to the trough, you cannot make him drink. The same underlying principles as expressed in that truism are applicable in the case of motor truck drivers. If you attempt to drive them, their work will be far from efficient and much below the maximum in amount. But if, on the other hand, you study their characters, discover their weak points, help them to correct their deficiencies and solve their problems, the success of your truck installation is practically assured.

It *is* assured, provided the trucks themselves are suited to the work imposed and are properly inspected and cared for. These are the necessities in successful truck operation which Finn's long term as delivery superintendent of one of Boston's largest department stores has taught him.

Finn joined the Jordan-Marsh organization 26 years ago, before motor trucks were even considered as the eventual means of efficient road transportation of to-day. For 8 years he was identified with the sales and adjustment departments. That term of service enabled him to get a thorough knowledge of the internal methods of package handling. This proved of great value to him when he was offered the position of delivery superintendent. It avails an efficient outside delivery system nothing if the goods do not reach the vehicles promptly and methodically due to poor interior handling means.



At that time the Jordan-Marsh company used horses exclusively. It still uses ninety, together with five electrics and twenty-four gasoline vehicles. Finn's problem has been to keep the horses where they are best suited to the work and to replace them where trucks can serve more efficiently.

This has required much study and experimentation on Finn's part. His work in this respect has made for long hours, much riding over the routes and the readjustment of the latter from time to time to accommodate the ever-changing character of the various localities served. He has been aided to a great extent in this work by his study of the drivers themselves. By keeping in close touch with them, helping them in their problems and treating them as he would be treated, Finn has won their confidence to such a degree that they trust in him. If one driver has a route which can be expanded to relieve that of another, he does not hesitate to advise Finn of it.

Much of Finn's success in obtaining the confidence of his drivers has been secured by his pleasing personality and a strict adherence to his word if once given. His experience has taught him that married men make better drivers than single men, because the former have more responsibility on their shoulders and are much more liable to listen to reason when questions of efficient work or proper behavior arise. For this reason all his drivers are married men.

Those who drive the horse wagons receive $15 per week and $1 per week bonus, or a total of $52 a year, paid between Christmas and the New Year.

The truck drivers receive $18 a week with the same bonus for work well done. Each driver receives 2 weeks' vacation every year with pay, is paid when absent from duty due to sickness and in many cases has his doctor's bills paid by the Jordan-Marsh company. This policy of Finn's as expressed in the acts of his company has resulted in keeping an efficient crew of drivers who are on their mettle by his promise of promotion from the horse wagon ranks to those of the trucks or to better-paying positions in the interior store organization. In this way Finn's drivers are contented and give a wholehearted service to his company.

In connection with the welfare of his drivers, Finn does not believe in the present practice of delivering packages to the homes of customers after 7 p. m. He has received many complaints from customers that they were disturbed during their evening meals because of the present practice of delivering as late as 9 or 10 o'clock. This practice has resulted from the keen competition between various department stores to obtain business on the basis of quick delivery. While Finn agrees that all customers are entitled to quick delivery within reason, it is his opinion that deliveries made after 7 p. m. are stretching the limit too far.

It is also his opinion that the practice results in a direct economic loss in that the drivers have to work overtime and that many times the customers are not at home to receive the deliveries. These must be brought back to the store and redelivered the following morning. This costs money and increases the unit delivery cost.

Finn maintains his fleet of electrics because it has greater speed capabilities than the horse equipment

(*Continued on page* 13)

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Help Uncle Sam—Buy A Liberty Bond

Issued in All Denominations for All Purses

WASHINGTON, May 28 — America's spring drive has begun. The country is raising money now that our troops and those of our allies may be fed. The citizen army of financiers is standing behind the army of fighters. This is not a war to be backed by big business, it needs the support of the wage earner. With this in view the Government offers $2,000,000,000 in bonds paying 3½ per cent in the following denominations: $50, $100, $500 and $1000. The bonds will be dated June 15, 1917, and interest will be paid semi-annually. The week of June 3 has been set aside as Liberty Loan week.

Easy Payments

If a wage earner cannot pay out $50 at once, or if it will inconvenience any subscriber to do so, the Government will allow the following terms: Two per cent of the face value may be paid at the time of application, 18 per cent on July 25, 20 per cent July 30, 30 per cent August 15, and 30 per cent August 30. For a man who is buying a $50 bond this will mean a first payment of $1, a second payment of $9, a third of $10, a fourth of $15, and a fifth of $15.

An application blank for a bond or bonds may be obtained at any bank or trust company. The applicant may transmit his application through one of these agents without charge or he may file it direct with the Federal Reserve Bank of his district or with the treasury department at Washington.

There are many persons who find it impossible to accumulate $15 at one time as is required by the installment payment of the Government. To meet this situation many business houses have agreed to purchase bonds for their employees, who may secure them by paying $1 weekly. Some of the trust companies and banks have agreed to buy bonds for their subscribers, who may pay for them on a weekly deposit basis. Where this plan is carried out the banks will probably charge 3½ per cent on the unpaid deposits and offer 3½ per cent on the deposits which have been made.

Stores Acting as Agents

Many stores are acting as agents for the bonds. Customers may buy "thrift checks" of smaller denominations than $50 and cash these in on Liberty Loans when they have accumulated to the required amount. Some companies have bought up Liberty Bonds with the intention of paying them as dividends.

R. Goodwyn Rhett, president of the United States Chamber of Commerce, has issued a statement to the business men of the country in which he points out the validity of buying a Liberty Bond even from the selfish standpoint. This money is to be used for our troops and our allies, but every cent of it is to be spent in this country. It really means a minimum of sacrifice for the United States because the money, when raised, will stimulate industry in the form of the large orders which will be placed with the industrial houses of the country.

100,000 FORD TRUCKS THIS YEAR

DETROIT, May 27—One hundred thousand Ford trucks will be built this year if material can be secured. Supplies sufficient for 10,000 trucks are on hand now. These facts were brought out in the Ford-Dodge suit to-day. Production will be at the rate of 25 a day in July.

MORE PRICE INCREASES

NEW YORK, May 25—Three commercial vehicle makers have advanced their prices. The Briscoe light delivery car has increased from $685 to $725. The Maccar Truck Co. has raised the prices of its models. The Dorris 2-tonner has advanced to $2,285. The advances in price are as follows:

Maker	Capacity Ton.	Former Price	New Price
Maccar	1½	$2,100	$2,250
Maccar	2½	2,600	2,700
Maccar	3½	3,250	3,400
Maccar	5½	4,150	4,300
Briscoe	½	685	725
Dorris	2	2,185	2,285

STEAMOTOR IS DOBLE TRUCK

CHICAGO, May 21—The Steamotor Truck Co., with a capital of $3,000,000, has been formed in this city to manufacture steam motor trucks using the Doble equipment. The company has been licensed under the Abner Doble patents.

Manufacturing arrangements have been made on a scale contemplating the production of 150 trucks per day.

ARCADIA TRAILERS ON MARKET

NEWARK, N. J., May 22—Arcadia trailers are being marketed in three sizes by the Arcadia Trailer Corp. of this city. The trailers are of the four-wheeled type, steering at both ends. The sizes are 2, 3½ and 5-ton capacity.

Coming Events

June 5.....Detroit, Meeting Starting Battery Division, Standards Committee, S. A. E.

June 7.....Detroit, Meeting Engine Division, Standards Committee, S. A. E.

June 8.....Detroit, Meeting Transmission Division, Standards Committee, S. A. E.

June 14.....New York City, Meeting Electric Vehicle Division, Standards Committee, S. A. E.

June 18.....Ottawa Beach, Mich., Meeting Standards Committee, S. A. E.

June 19.....Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.

June 20.....New York City, Monthly Meeting of the Motor Truck Club of America at Noontime.

June 20.....Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.

June 25-26.....Washington, D. C., Summer Meeting S. A. E., Bureau of Standards.

Truck Fender Law Unconstitutional

Chicago Ordinance Held Not Valid by Circuit Court

CHICAGO, May 17—The much agitated truck-fender ordinance has been declared unconstitutional and discriminatory by Judge Fred A. Smith in the Circuit Court of Cook County. This closes the first chapter of a 2-year record of fight by the truck owners in the city against a flagrant attempt to capitalize for private gain the efforts of the city to safeguard pedestrians.

The history of the truck-fender ordinance in this city dates from July, 1916, when the council passed a measure requiring that all commercial vehicles over 1500 lb. capacity and not carrying passengers must be fitted with fenders approved by a city committee. Six months were given in which to test out fenders which local concerns were making an effort to have indorsed by the police department. The chief of police refused to give his indorsement to the devices submitted. The truck owners and their organization, the Motor Truck Owners Association, found it impossible to purchase fenders, and the association believed that the fender makers wanted the city's indorsement in order to interest capital to manufacture. On March 16 last a temporary injunction was granted against the inforcement of the ordinance by Judge Smith. At the final hearing Judge Smith ruled that inasmuch as the ordinance does not include the lighter commercial cars and those designed to carry passengers, the ordinance is discriminatory and therefore illegal.

HIGRADE TRUCKS OUT SOON

GRAND RAPIDS, MICH., May 17—The Higrade Motors Co., which was organized early this year, will soon commence steady production of its Higrade trucks. The company has purchased a tract of land in this city and will erect a factory to be completed early in September, but arrangements are being made for putting the first trucks on the market about July 20. The first thousand cars will be made in the experimental shops at Harbor Springs, Mich. The company is manufacturing a ½-ton truck. The chassis weighs 2310 lb. and with the heavy express body and full top the weight is approximately 2800 lb. The equipment includes standard 32 x 4 tires. The wheelbase is 115 in., with 102 x 48 floor space, clear of the driver's seat. The wagon bed floor is 30 in. from the ground. The engine is a Wisconsin 3¼ x 5 four-cylinder truck motor equipped with a Bosch high tension, ignition, lighting and starting outfit. Sheldon worm drive axles and spring suspension, Spicer direct drive; Borg & Beck disk clutch; Lavine semi-irreversible worm steering gear; Fedder cellular radiator; Parish frame members constitute the most important units. The car has a turning radius of 22 ft. The price, which has not yet been settled upon, will be under $1,600.

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High Truck Fees in Connecticut

New Law Requires Mirrors; Rubber Tires Only

HARTFORD, CONN., May 19—The new motor vehicle law which has just been passed by the Connecticut legislature and goes into effect June 1 makes some strict provisions for motor trucks. The fees charged these vehicles follow:

One thousand pounds and under, $11; 1 ton, $15; 1½ tons, $20; 2 tons, $25; 2½ tons, $30; 3 tons, $35; 3½ tons, $45; 4 tons, $55; 4½ tons, $65; 5 tons, $75; 5½ tons, $87.50; 6 tons, $100; 6½ tons, $112.50; 7 tons, $125; 7½ tons, $150; 8 tons, $200; every additional ton, $100.

The law declares that any vehicle between ratings enumerated above shall be charged the higher figure of the two. When these figures are compared to the Massachusetts registrations of $5 for one ton and $3 for each additional ton the jumps of $10 per half ton in the Connecticut law look exceptionally big. There is a provision that all trucks so built that a clear view is not given behind at all times shall be equipped with mirrors. Also the trucks shall all be shod with rubber tires so that no iron may come in contact with the highways. The law provides also that no person shall operate a commercial vehicle over any highway or bridge when the combined weight exceeds 25,000 pounds without a written permit from the city or town officials, and they shall prescribe the conditions.

The speed of trucks is limited. If any commercial vehicle not equipped with pneumatic tires exceeds the rate of 15 m.p.h. on any highway or 8 m.p.h. on any bridge or at any intersecting way it shall be prima facie evidence of violation of the speed law. The driver of a motor vehicle who figures in an accident must stop and make himself known, and if he does any damage to property of $10 or more he must report it to the motor vehicle commissioner. No vehicle shall be driven past a street car that has stopped to let on or take off passengers unless there is 10 feet between the car and the truck, and then the speed must be reduced to 5 m.p.h.

Passenger buses are covered in the law in a proviso that says the passenger compartment of public service motor vehicles shall during the hours when motor vehicles are required to display light be lighted by at least the light of not less than four candle power, and shall, if closed or partly closed, be so constructed as to give a free view of the interior of such vehicle as shall be prescribed by the motor vehicle commissioner. No public service vehicle shall carry any person upon the running boards, mudguards or hood, nor shall the total number of persons carried exceed two more than the regular carrying capacity.

Motor vehicles having a carrying capacity of more than two tons shall have conspicuously on view on each side of the body near the driver's seat a plate or permanent marking showing the carrying capacity in pounds of said vehicle and also the weight of the vehicle.

FAGEOL TO BUILD SOON

OAKLAND, CAL., May 22—Ground for the truck plant of Fageol Motors Co. will be broken about June 6. Ten acres have been secured as a factory site.

Help Your Truck Drivers

(*Continued from page* 11)

and is cheaper to operate in the middle delivery zone between that served by the horse wagons and the outlying suburban territory in which the gasoline trucks are employed.

Although Finn works in Boston, whose merchants are supposed to be more conservative than those in any other part of the country, he has not absorbed all of their conservatism in that he has tried a patent liquid air compound in all the pneumatic tires of his trucks working on the long routes. That compound is placed inside of the inner tube and is supposed to close any hole which may be cut into it by nails, etc., on the road. Finn has used it for more than 1 year and states that it has proved successful in that the time lost in repairing punctured tubes on the road has been reduced to almost a negligible amount. In order to preserve the tubes, which last indefinitely with the compound in them, the casings are removed from the trucks on the long routes and placed upon those working on the shorter ones. This change, however, is not made until after the casings have been run for the distance of the manufacturer's guarantee. In every instance the use of the compound has resulted in increased mileage per casing.

Strikes Gross Sales Tax From List

Senate Finance Committee Revises War Revenue Bill

WASHINGTON, May 26—No tax will be placed on the gross sales of motor vehicles, if the recommendations of the Senate finance committee are adopted. This proposed business tax was incorporated in the war revenue bill which passed the House and was referred to the Senate committee. It is considered possible that a Federal license will be required of motor vehicle owners to make up the deficit lost by not passing this manufacturers' tax. It is probable, however, that commercial vehicles will be exempt from this license provision, since the chief aim of the bill has been to tax so-called luxuries. The bill has yet to come before the Senate, the conference committee of the two houses, and for final vote by Congress. There is therefore a possibility that the gross sales tax will be reinstated, but it is not at all probable that the finance committee will be overruled on this point.

Strong protest against this taxation on the automobile industry has been made to the finance committee during the past 3 weeks by the trade press, the National Automobile Chamber of Commerce, the Motor and Accessory Manufacturers, the Rubber Assn. of America and others.

Among the arguments objecting to motor trucks being classed as luxuries was that of Alvan Macauley, president of the Packard Motor Car Co., Detroit, submitted to Senator F. McL. Simmons, chairman of the finance committee. Mr. Macauley stated that the truck industry is new and therefore not yielding excessive profits, that trucks are needed to aid the congested freight situation, that trucks are vitally needed by the army, and that truck making should therefore be encouraged rather than handicapped by a special "luxury" tax.



This was one of the most distinctive floats seen in the recent celebration in honor of the French War Commission in New York. A big Packard carried bodily a Ford ambulance which distinguished itself at the battle of the Marne

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Army to Open Truck Bids June 10

Government Calls For From Two to 76,000

WASHINGTON, D. C., May 22—Bids for 76,000 motor trucks for the United States army will be opened by the War Department at Chicago as follows:

On June 10 bids will be opened for 1 to 35,000 1½-ton trucks and for 1 to 35,000 3-ton trucks.

On June 11 bids will be opened for 1 to 200 ½-ton trucks; 1 to 200 ¾-ton trucks; and 1 to 200 1-ton trucks.

No awards will be made under this opening of bids but offer and prices remain open during the fiscal year beginning July 1, purchases being made by the army as required. Prices to be quoted are f. o. b. factory. Time required to ship after receipt of order is one of the points on which information is requested. All vehicles bought are to be inspected by the Government on delivery.

The opening of these bids in Chicago will mark the new policy of the Quartermaster's Corps, which is to buy motor cars in the future through the Chicago instead of the New York offices.

Bids have already been asked on orders of from 1 to 35,000 trucks of light and heavy types, known officially as class A and class B, and present estimates indicate that they can be secured from the existing manufacturing plants as fast as they are required. The War Department has no present expectation that it will have to resort to commandeering private machines in commercial service. The new army trucks will be of a construction which would handle, in commercial service, loads of approximately 3 to 5 tons respectively. The specifications for these new trucks were formulated by the War Department Motor Transport Board, of which Col. Chauncey B. Baker is the head, in conjunction with several divisions of the standards committee of the Society of Automotive Engineers, after an exhaustive study of European and American field experience. The specifications were published in THE COMMERCIAL VEHICLE, May 1.

NEW MOTOR VEHICLE DEFENSE COMMITTEE FORMED

WASHINGTON, May 24—The Council of National Defense has created an automotive committee to serve as a co-operative committee under the leadership of Howard Coffin, chairman of the committee on munitions of the advisory commission. It will be the function of the new committee to advise and assist the Government departments on all matters involving the use of internal-combustion engines, including the production of motor cars, trucks and ambulances, tractors, motor boats and airplanes. The membership of the committee is as follows:

Chairman, Charles Clifton, president of the National Automobile Chamber of Commerce; C. W. Stiger, president of the Motor and Accessory Manufacturers; Coker F. Clarkson, general manager, Society of Automotive Engineers; Frank H. Russell, president, Aircraft Manufacturers' Association; H. L. Horning, chairman, tractor standards division, Society of Automotive Engineers; Henry R. Sutphen, chairman, marine standards division, Society of Automotive Engineers; K. W. Zimmerschied, past chairman, standards committee, Society of Automotive Engineers.

Mr. Zimmerschied will act as manager of the committee, and will be in charge of its office in Washington.

227 MEMBERS FOR S. A. E.

WASHINGTON, D. C., May 16—The result of the special membership campaign of the Society of Automotive Engineers conducted during April was apparent at to-day's meeting of the council held in the offices of the society here in the Munsey Building, when 227 applications for membership were passed upon. Of these seventy entered into full membership, 110 into associate membership, twenty-one as juniors and twenty-six as enrolled students.

ELECTRIC ASSN. CONVENES

HOT SPRINGS, VA., May 19—To-day marked the closing of the first annual meeting of the Automotive Electric Assn., at the Homestead Hotel, this city. The 3-day session was attended by approximately forty from the eleven company members.

A sub-committee has been appointed to handle the work in connection with supplying the government with electrical equipment for use on trucks and airplanes.

This association was formed last April and is composed of manufacturers of automotive electric accessories, as follows:

Dayton Engineering Laboratories Co., Dayton.
Dyneto Electric Corp., Syracuse, N. Y.
Electric Auto Lite Co., Toledo.
The Leece-Neville Co., Cleveland.
North East Electric Co., Rochester, N. Y.
Remy Electric Co., Anderson, Ind.
The Robbins & Myers Co., Springfield, O.
Splitdorf Electric Co., Newark, N. J.
U. S. Light & Heat Co., Niagara Falls, N. Y.
Wagner Electric & Manufacturing Co., St. Louis, Mo.
Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa.

G. B. Griffin of Pittsburgh is president; C. O. Mininger of Toledo is vice-president; G. S. Cole of Cleveland is secretary; and C. L. Amos of Syracuse is treasurer.

108,036 HORSES IN NEW YORK CITY

NEW YORK, May 16—Statistics of the New York Electric Vehicle Assn. show that there are still 108,036 horses in New York City. The association figures that the situation leaves a large opportunity for the sale of motor driven vehicles to displace the horse, which is a less economical means of transportation than mechanical power.

Truck Accessories Are to Be Standardized

S. A. E. Committee Confers with Quartermaster's Dept.

WASHINGTON, May 17—Several members of the truck standards committee of the Society of Automotive Engineers met here recently with a dozen or more representatives of truck factories and representatives of the quartermaster's department to take action in standardizing various so-called accessories that will be needed for the military trucks. The work centered around such matters as front and rear bumpers, towing hooks, seat arrangements, large gasoline tanks, magneto straps and couplings, radiator guards, and other matters with regard to dust collectors for the carbureters and generator mountings. The work consisted largely of finding out what can be done along these lines, and also in the representatives of the quartermaster's department laying before the manufacturers what it considered necessary in this work.

The department submitted general drawings showing the scheme of seat for military trucks, which accommodated beneath it the 30-gal. gasoline tank, as well as the tray for holding the battery. The seat accommodates four persons.

Towing hooks will be required for four-wheel drive trucks, which, it is understood, are the only ones that will draw trailers. The ordnance type of towing hook has been agreed upon.

For two-wheel drive trucks the front bumper is to be a heavy channel section backed up by springs. The rear bumper is a large ash or oak piece 56 in. long and of 3 by 8 in. section.

The 30-gal. gasoline tank is made with two reserve compartments of 6 gal. each. A three-way drain allows of using one and then the other of these reserves. The drain cap always insures one of the reserves being in use, even if through carelessness the other one might not be.

A standard type of magneto strap for holding the magneto on its seat was agreed upon, as also was a form of magneto coupling. While these two cannot be looked upon as standards, it is understood they will be preferred on all military trucks.

The truck manufacturers present agreed to co-operate on the matter of generator mounting, and also on the problem of securing a satisfactory dust collector for the carbureters. Nothing specific in either matter apparently was submitted and Captain Britton, of the quartermaster's department, expects that, through the co-operative work of the truck makers, some possible style to be preferred will be developed.

BROUSSEAU HEADS I. M. C.

NEW YORK, May 28—A. J. Brousseau has been elected president of the International Motor Co. and will take charge of its affairs June 1. He is now vice-president of the Federal Motor Truck Co. of Detroit.

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Krebs, Lincoln and Clyde Are Combined

To Offer Six Models to Be Known as Clydesdale

CLYDE, Ohio, May 17—The Krebs Commercial Car Co., Clyde, Ohio; the Lincoln Motor Truck Co. of Detroit, Mich., and the Clyde Cars Co., Clyde, Ohio, have been merged into one company, to be known as the Clyde Cars Co., and to offer to the market six models of trucks, which will be known under the name of Clydesdale, with the following capacities: ¾, 1, 1½, 2, 3½ and 5-ton. The capitalization has been increased to $500,000.

C. R. Dunbar of Holyoke, Mass., a New England distributor of pleasure cars and trucks, has been elected president of the new company; J. C. L. Krebs of Clyde, Ohio, is vice-president and general manager; W. P. Dodge, formerly treasurer of the Barney & Berry Co., skate manufacturer of Springfield, Mass., has been appointed assistant treasurer and sales manager; J. B. Crockett, president of the New York automobile exporting house of J. B. Crockett Co., Inc., is treasurer, and Homer Metzger of Clyde is secretary.

The Krebs Commercial Car Co. has been engaged in the manfacture of trucks at Clyde for several years past, and the factory of this concern, which includes over 80,000 feet of floor space and a large machine equipment, will be the scene of manufacturing activities, all tools and materials of the Lincoln Motor Truck Co. having been removed to Clyde from Detroit. Plans are complete for further expansion and ground will be broken within the next 30 days for new buildings.

FORM SAMSON TRAILER CO.

GRAND RAPIDS, MICH., May 25—The Samson Trailer Co. has been organized here. J. C. Ayres, of Towar-Ayres Co., Republic dealer in Detroit, is one of the chief organizers of the new company.

HESS-BRIGHT BEARINGS FOR WAR TRUCKS

PHILADELPHIA, PA., May 25—Government orders for thrust and ball bearings have been awarded to the Hess-Bright Mfg. Co. These bearings are for use in army trucks, aeroplanes and submarine chasers.

TIRE DIVISION FOR RUBBER ASSN.

NEW YORK, May 19—A tire manufacturers' division of the Rubber Assn. of America is to be organized. Representatives of about forty of the principal tire companies approved such a move at a meeting held yesterday at their request.

The division will take up the problems peculiar to tire manufacture with a view to solving them in a manner acceptable to all. Formal organization probably will be completed in about three weeks.

The meeting went on record in favor of adopting a standard contract clause covering fluctuations in the prices of tires. This clause provides that if the manufacturer finds it possible to reduce prices to the dealer, he will give the dealer the benefit of the reduction; similarly, if the manufacturer increases prices the dealer is to have the choice of accepting the balance of unfilled contracts at the advanced price, or of cancelling the balance of the contract.

PIERCE-ARROW 4-MO. PROFITS $1,341,132

NEW YORK, May 23—Operating profits of the Pierce-Arrow Motor Car Co. for the 4 months ended April 30, after deducting all expenses and accrued taxes, except tax on excess profits, amounted to $1,502,833. Net profits for this period were $1,341,132, after deducting $5,257 interest charges and $156,444 for depreciation of plant and equipment. The company estimates excess profit tax at approximately $73,000 for the 4 months, basing this figure on existing laws, but has made no reservation in respect to proposed taxes now under discussion.

COMMERCIAL TRUCK STATES PATENT RIGHTS

PHILADELPHIA, PA., May 22—Rumors in the trade that the Commercial Truck Co. of America, maker of electric commercial vehicles, claimed to have a basic patent on the worm type of final drive gear, have been corrected in a recent letter from the company to THE COMMERCIAL VEHICLE. The company does not claim such a patent, but has an exclusive patented design, Patent No. 1,065,413, in which the worm wheel and worm gear are carried in a unit by the cover and can be removed in that unit.

FORD PRICE INCREASE NEAR

DETROIT, May 16—The Ford Motor Co. is notifying its dealers that an advance in price may be necessary in the near future. Unfilled orders now on books amount to 100,000 cars, and these will be filled at prevailing prices, but dealers have been notified that all orders from this time on are subject to an advance in price, and that delivery to consumers must be subject to price advance.

TRUCK CLUB ADDS 200 MEMBERS

NEW YORK, May 19—Two hundred new members were added to the Motor Truck Club of America as a result of a 4-day intensified campaign carried on by ninety of the present club members who formed themselves into thirty committees of three each and personally invited prospective members to join the club.

Many committees reported that they could not secure memberships in some instances because those in authority were not in their offices. As a result, these prospects were followed up during the following week and one additional day, Friday, May 18, was given over to a last intensified effort to bring all such prospective members into the club. It is estimated that this work will result in 500 new members.

Truck Driver Recruiting Progresses Rapidly

Great Need for Men in Other Quartermaster Work

NEW YORK CITY, May 29—Great progress has been made in recruiting motor truck drivers into the Enlisted Reserve Corps, Quartermaster Department, in all sections of the country during the past 2 weeks in which no less than twenty-five companies were enrolled and accepted by the Government. So far the Central Section of the old Department of the East is leading with eighteen complete companies enrolled. Slightly more than five of these have been recruited by the civilian committee in Philadelphia and the surrounding territory, while the remaining thirteen have been recruited in New York City and vicinity by the aid of the civilian committee of the Motor Truck Club of America, which has maintained a special recruiting office at the Motor Truck Club at 1790 Broadway.

The civilian committee in Boston, Mass., has recruited two full companies which are now ready for service. Others are being organized rapidly. The F. W. D. Co. in Boston aided the work of the committee by publishing in its advertisements in Boston newspapers the qualifications necessary for enlistment.

Six complete companies have been recruited in the Central Department with headquarters at Chicago. No civilian committee has been arranged for in Chicago as yet, the work being carried on directly by the Quartermaster Department under the direction of Captain Webster and Lieutenant Maloney at the Federal Building, Chicago.

Recruiting work has also been started in Detroit under the direction of Captain William E. Dunn. Names of 1800 drivers in the Detroit territory have been obtained from truck users there and it has been found that of this number 450 have no dependents. The recruiting work is being carried on energetically.

The civilian committee for the new Department of the East, which is composed of members selected by the Motor Truck Club of America, has appointed five new committees as follows:

Scranton, Pa., for the counties of Susquehanna, Wayne and Lackawanna, W. M. Gardner, chairman, 411 Board of Trade Bldg., Scranton, Pa.

Buffalo, N. Y., for the counties of Erie, Niagara, Chautauqua, Cattaraugus, Wyoming, Genesee, Orleans, Livingston, Monroe, Waynem, Ontario, Yates and Seneca, A. F. Osborn, chairman, Quartermaster Enlisted Reserve Corps Office, 45 West Mohawk Street, Buffalo, N. Y.

Albany, N. Y., for the counties of Herkimer, Otsego, Fulton, Montgomery, Saratoga, Schoharie, Albany, Greene, Rensselaer, Washington, Warren and Hamilton, Henry D. Rodgers, chairman, Albany Savings Bank, Albany, N. Y.

Syracuse, N. Y., for the counties of Onondaga, Oswego, Cayuga, Tompkins, Cortland, Madison, Oneida, Jefferson and Lewis, S. H. Cook, chairman, 105 E. Jefferson Street, Syracuse, N. Y.

Newark, N. J., for the northern half of the State of New Jersey, excluding the counties of Hudson and Bergen, A. Preston Jump, chairman. Manager Coastwise Department, U. S. S. P. Co., 30 Church Street, New York City.

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Better Truck Maintenance and Repair

Two Pages Each Issue on the Best Repair Ideas for Owners

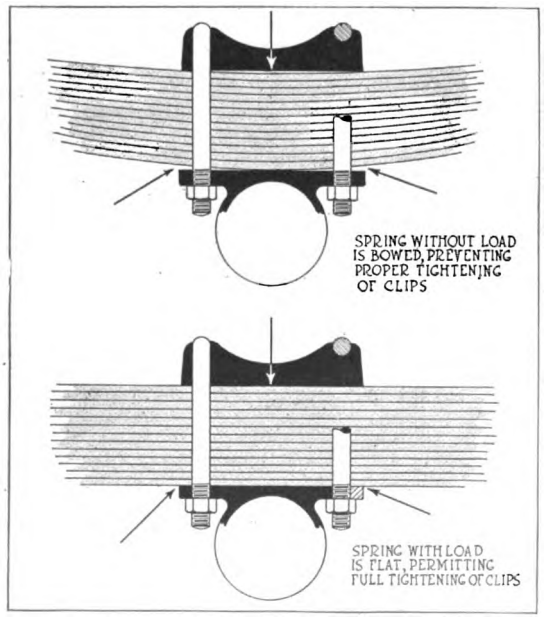
Write us a letter telling how you maintain your trucks efficiently or of some good motor truck repairs you have made

A minimum of $1 each will be paid for accepted ideas on better truck maintenance and repair suitable for these pages. Simply send in a rough pencil sketch bringing out your idea and as few words as possible in order to explain it

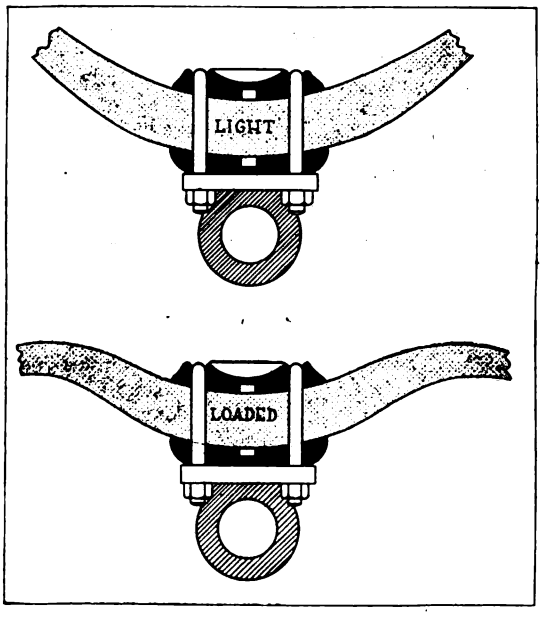
More on Keeping Spring Clips Tight

E. C. SHUMARD, chief engineer of the United States Motor Truck Co., Cincinnati, Ohio, has the following to say in regard to keeping spring clips tight, as first illustrated in this department in the April 15, 1917, issue by the sketch of W. C. Denman:

"The cause for the springs loosening is that the plates wear against each other and the clips, and there is usually some stretch in the clips. I have guarded against this in the trucks of my design by using the highest grade nickel steel for the clips, thus reducing the amount of stretch to a minimum. Note the sketch given below, showing the bending action of the springs and the shape of the upper and lower spring pads. The latter are carefully shaped



Denman's sketch in THE COMMERCIAL VEHICLE *of April* 15, 1917



Shumard's sketch as submitted to THE COMMERCIAL VEHICLE

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to spring when the truck is light and the clips relied upon to keep them tight through their non-stretching qualities."

The sketch as published in THE COMMERCIAL VEHICLE of April 15, 1917, is shown on page 16 at the left and Shumard's sketch on the right.

How Leipert Tests for Loss of Power

LOSS of engine power can be traced to one or more of the following causes, according to A. H. Leipert, service manager of the International Motor Co.:

1—Pump not circulating due either to the rotor becoming disconnected from the pump shaft or the pump shaft from the driving shaft.

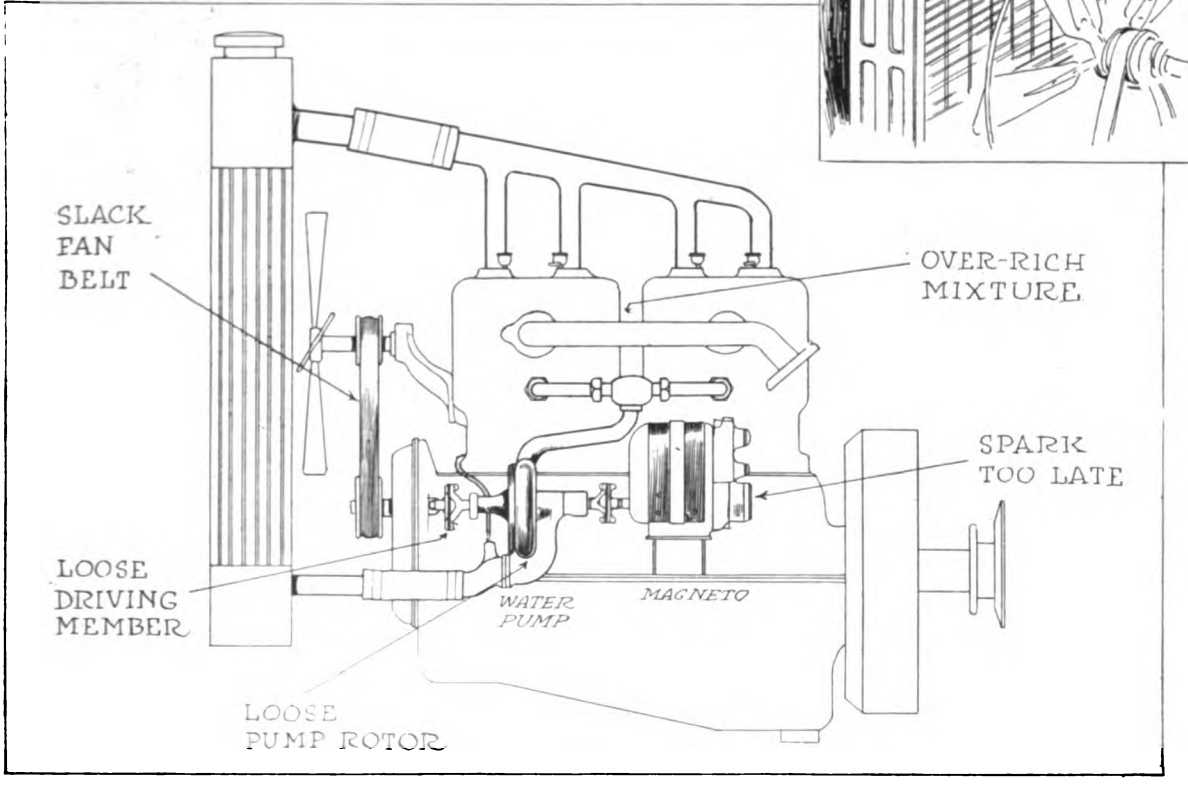
2—If fan belt is loose for any cause so that the fan does not revolve at the speed at which it should in order that the water be cooled to the proper temperature.

3—If the setting of the ignition spark advance is too late, thereby causing over-heating.

4—If the gasoline mixture is too rich. This can generally be detected by the dark, bluish color of the exhaust and by its smarting effect upon the eyes.

A good way to tell if the circulating pump is not working is to remove the radiator filler cap and look at the surface of the water in the upper tank. If it is smooth and quiet, it shows that there is no circulation. If the surface is rough, as when water is bubbling, the circulation is O. K. If this is found to be the case, then the fan belt, spark advance and gasoline mixture should be investigated as above outlined. If all these are correct, then examine the clutch for slipping, and finally the brakes for overtightness. Tight brakes consume considerable power which should be diverted to propelling the truck.





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Some of the French trucks leaving the Cama at Lyons preparatory to a short run for the purpose of instructing recruits in the fine points of driving war trucks in proper convoy formation

French Cama Holds Many Lessons for Those in Charge of Uncle Sam's War Trucks

Buying and Equipping of All French Army Trucks Is Well Organized

By W. F. Bradley

PARIS, FRANCE, May 15—Groups of initials are employed almost exclusively to designate the various departments of a modern army. To the average civilian they are as unintelligible as Sanscrit, and even to the military man whose training did not extend beyond the middle of the year 1914 these letters are a mystery. Thus, under the title of the "cama"—they pronounce the c hard, as in "kill"—there does not appear to be anything to interest a motor truck owner.

Yet beneath these apparently unintelligible letters, the French translation of which it is hardly necessary to give, is to be found the great motor truck organization which stands back of the French army in the field. That organization is the biggest the world has ever seen, or probably ever will see, for France makes a greater and more varied use of trucks than any of her allies, or enemies, in the field.

What the Cama Is

The "cama" is the huge truck supply department of the French army. When the United States becomes sufficiently involved in the war to be interested in the "cama" it will establish that department at Detroit. But France possesses two truck-producing centers, the greater one being at Paris and the lesser at Lyons. Thus she has a "cama" in each district. The latter one, with which this article is particularly concerned, receives trucks from the Lyons factories, from Italy and from the few makers in the center, east and west of France. It differs from Paris in that it handles neither metropolitan nor American makes.

This story was obtained by W. F. Bradley, the special correspondent of THE COMMERCIAL VEHICLE with the allied armies, by special permission of the French War Department. The manuscript was submitted to the Ministry of War and approved. Photographs were approved by the French censors.—EDITOR.

Between the factory which produces trucks and the army which uses them there is this important and extremely useful organization. Trucks and passenger cars are not placed on freight cars and shipped direct from the factory door to the war zone—at any rate not under the highly-developed war system prevailing in France. The "cama" places contracts with the various factories; it receives fleets of complete trucks or bare chassis as the case may be; it tests every one; it equips them much more carefully than the private motorist fits out his car for a long tour; it trains drivers for these vehicles; it forms them into convoys in charge of competent officers, and finally it sends them out, complete in every respect, for active service in the war zone.

Fiat, for instance, is one of the most important suppliers to the "cama"; but as these factories at Turin are supplying the Italian, English, Belgian, Russian, and probably also the armies at Salonica, with various types of vehicles, it is more advantageous that they should send the standard chassis, without attempting to equip it to suit the requirements of the individual armies. The Lyons factories, which are located almost at the door of the "cama," do not always produce their own bodies. Thus, instead of allowing these factories to send their chassis to a local bodymaker, the "cama" takes delivery of them in the first place, makes contracts with the bodymakers, and incidentally supplies most of the raw material, and attends to the detail equipment in its own shops.

To American eyes this may seem a needless complication and a source of additional expense. But in other and similar organizations, where supposedly complete American vehicles are handled, the same preparations have to be gone through. Not one of the American trucks is equipped exactly as the army wants it; and even if they were correctly equipped, the "cama" would be necessary in order to verify them, to supply them with drivers, and to send them away as self-contained units capable of following an army anywhere.

Army Equips Own Trucks

It has been proved, however, that the army can get better service and cheaper service by equipping its own vehicles than by getting them complete in every respect from the factory. I was given examples of this in lamp brackets, in spare gasoline can carriers, in tool racks and in various other fittings, all of which could be made by the army cheaper than manufacturers could supply them. In arriving at prices, standard rates of wages were calculated, and not an estimation of the cost of the soldier to the State.

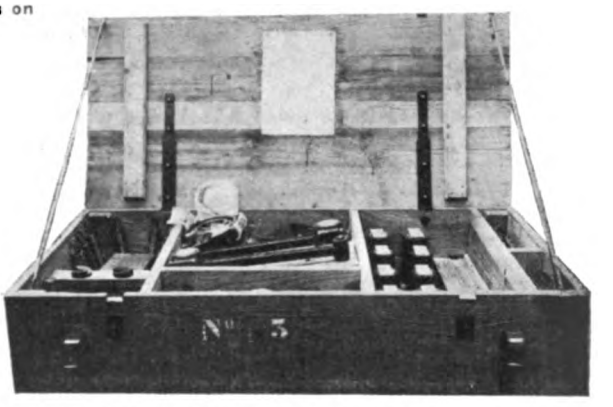
On the day I first visited the "cama" there was a display which could not have been better staged if it had been done on purpose to impress. In the main avenue were lined up forty Fiat field ambu-

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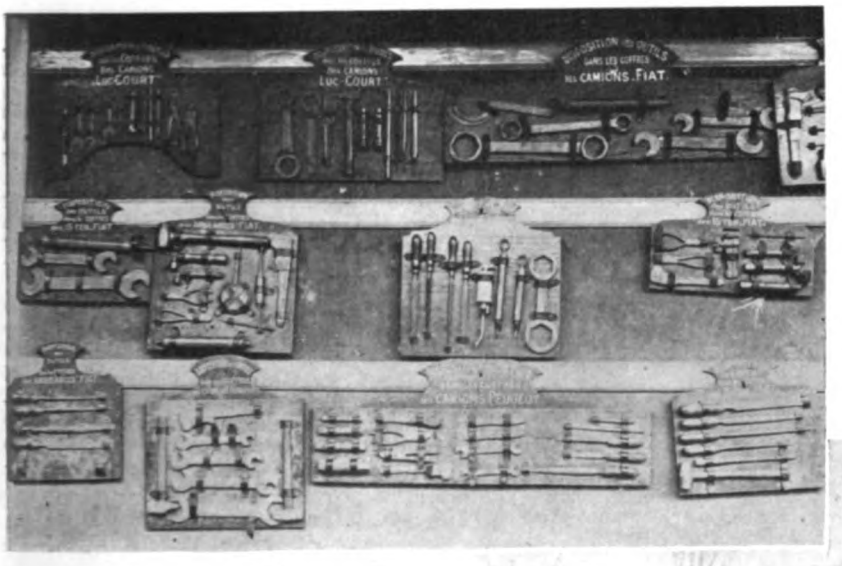
The French Cama at Lyons and How War Truck Tools and Spares Are Carried



At the Cama: A few of the trucks as they are received by the government from the maker without bodies or accessories. They will soon be fitted with army bodies and then sent forward to take their places in active service. Such transformation goes on day after day with unfailing regularity



Spare truck parts as packed in the box in which they are sent with the convoy going to the front. The spares are not given to the driver but are carried in the repair truck of the train

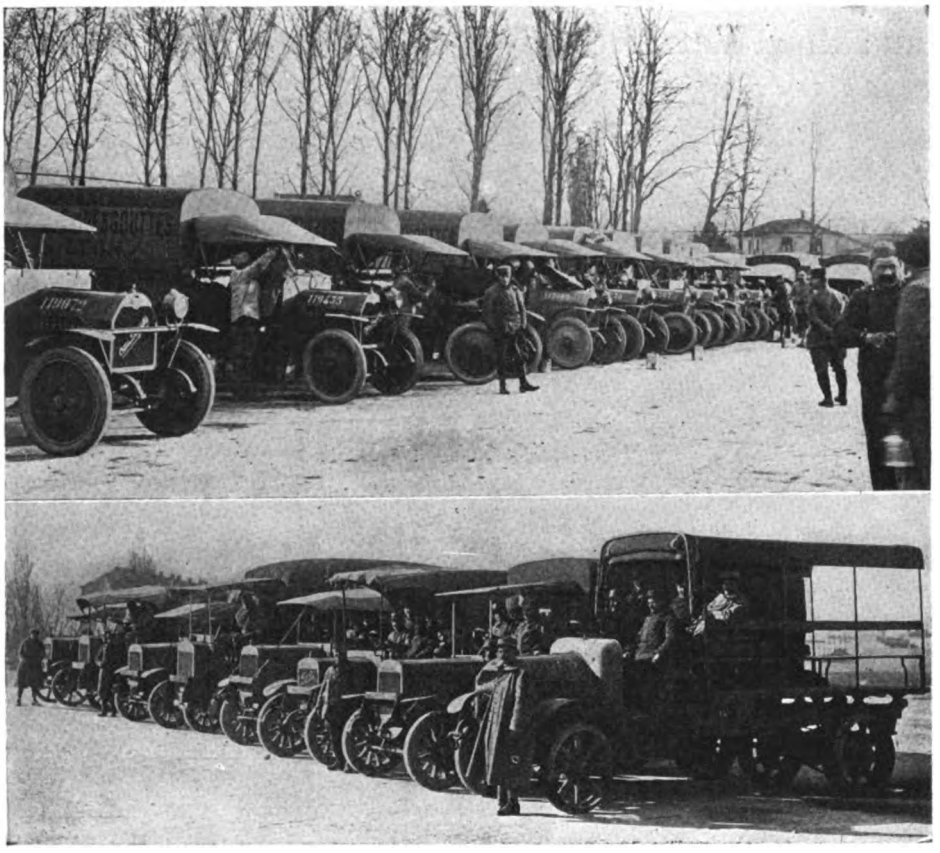


Model tool layouts for various makes of trucks. These are the only tools given to the truck drivers. Note how each tool has its own particular place and how the absence of one can be noticed at once



Ambulance chassis under canvas covers at the Cama and awaiting their turn to have bodies mounted. Note the large number shown and the regularity of the lines in which they are placed

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The top view shows several convoys of light trucks being fitted up at the Lyons Cama. Note the identical equipment on each vehicle and the steel wheels and bumpers. At the bottom are trucks to be taken out by novice drivers for training. The truck at the right is the examining officer's vehicle

lances, completely equipped and ready to leave for the front. In another avenue were twenty Berliet trucks and one repair truck, also ready to go out on active service. When I returned 24 hours later the ambulances had disappeared and their place was occupied by a long line of Fiat 15-20 hp. chassis which had been verified and were about to pass into the body builder's hands; in place of the finished Berliet trucks there was a row of Peugeot chassis ready to have their equipment fitted.

Transformation Goes On Regularly

This transformation goes on day after day with unfailing regularity, one or several convoys going out every 24 hours and bare chassis coming in with almost the same uniformity. In the grounds of what had once been a French Coney Island truck chassis to the value of about $1,000,000 were to be found under tarpaulins ready to go into the body-making and fitting shops.

Another department of this organization deals with repairs only. France has organized one immense central clearing station for all trucks which cannot be repaired by the traveling workshops attached to the convoys in the field. From this clearing house the wrecks are sent to the repair departments of the different "camas," where they are completely overhauled and most of them sold to contractors engaged in supplying the army. Not very many of these vehicles sent out of the war zone are ever sent back again. On the other hand convoys which have suffered heavy losses in the field are sent to the rear to be re-equipped and sent out again with the same men and the same vehicles.

When chassis are received from the manufacturer they are supposed to be mechanically perfect. But nothing is taken for granted. Each shipment is taken on the road for a test run of about 30 miles, an experienced army officer being in charge and a factory driver at the steering wheel. This trip is not intended to test the endurance of the chassis, but just to assure that nothing has been scampered or neglected, and is a guarantee that when the convoy goes on the road the army driver will not have to tinker.

Lubrication is verified, for some makers are not above practising such small economies as putting the smallest amount of grease or oil in the gearset, the rear axle, the engine, steering gear, etc. Close reckoning is sometimes carried so far that the amount of gasoline put in the tank is only just sufficient to go from the factory to the gates of the army depot. Sometimes the quantity was short by 50 yards, in which case the army had to supply a spare can, until the officers refused to consider any vehicle delivered until it was actually inside the grounds.

Cama Buys Equipment

Obviously no changes have to be made on the chassis, nor does the body need any modifying; but important work has to be done by the "cama" in the equipment of the cars and trucks. No truck manufacturer makes his own accessories, so that there is no advantage in allowing the truckmaker to buy his lamps from Jones, pay one of his own men to fit them, and then sell them to the army. The truck section of the army goes direct to Jones and buys its own lamps, and not only lamps but jacks, tools, sponges, oil cans, horns and the thousand-and-one accessories required on cars and trucks. This system has been extended so that the army now makes many of its spare parts. In any case the army would have to supply the factory with raw material, for under present conditions the Government practically has a monopoly of all metals; thus it is cheaper to keep the material and make the parts in the army shops. In other cases stampings and castings are received in the rough and machined at this central supply depot. Again the cost is lower, even when estimating wages at the rates paid in the open market.

Old and Maimed Employed

All the men employed in the workshops are the older classes who could not in any case be called up for service at the front. As far as possible maimed men are given a chance, for France has seriously tackled the problem of giving a new start to men who have suffered some physical disability while fighting for the country. Although this is a purely military establishment and every worker from the most skilled engineer to the roughest laborer has a military rank, female labor is not refused. The example can be found on even a bigger scale in the civilian establishments.

The system of tools and spares developed by the "cama" is remarkably interesting. The guiding principle is that the convoy, which may consist of twenty to thirty trucks, shall have everything necessary to keep it working under the best

(*Continued on page* 23)



A convoy of ambulances which has just been passed through the Cama and is now ready to start for the front, where it will be placed in the medical corps of the transportation department for active service

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Horse Glanders Communicable to Human Beings

Hostlers Mostly Infected, But Even Pedestrians Are Not Safe

GLANDERS is known as the great plague of the domesticated horse, but that it is a contagious disease often fatal to human beings, that pedestrians on the street are exposed to it, and that it may be present in either a man or beast for some time is not generally known. If it were, says Dr. Frank G. Atwood, veterinarian, of New Haven, Conn., who has made a study of this disease, horse owners would recoil in horror from the idea of using the enslaved beasts longer and would adopt motor trucks for purely sanitary reasons.

It has been known for 87 years that glanders was communicable to human beings and that it might result fatally, but for some reason this has not become generally known—even among physicians—with the result that human glanders has been diagnosed erroneously as eleven other and quite different diseases.

Another remarkable fact is that horse owners often fight attempts to stamp out the disease, although it is the usual custom in such cases for the state to purchase the animals from the owner and destroy them. The reason, no doubt, is that the disease in its incipient state is much more widespread than is generally recognized, and were the facts known it might well be feared that the horse business, in crowded cities at any rate, would be seriously depressed.

In the hope that this much-to-be-desired result will take place, this article is written.

Blind glanders, as the incipient state is commonly called, or occult glanders in preferred nomenclature, may exist for a long time without making itself evident save for a tendency of the horse to tire easily. In this state, however, they are active spreading agents of the disease, both to other horses and to human beings. How easily it is communicated is evidenced by hundreds of cases of human glanders on record. There is one case on record of a woman pedestrian who caught the disease from having a horse cough in her face. Another case was a man who touched a horse's lips with a scratched hand.

Pedestrians Not Safe

Most of the infections come from men who tend horses, but the ordinary citizen is not entirely safe. A case is on record in which a house dog belonging to a wealthy family at Winsted, Conn., subjected a whole household to the disease by dragging the tail of a dead glandered horse into the kitchen, the dog himself dying of the disease later.

Laws restricting the spread of glanders are good in most of the states, but they are not uniformly enforced—not enforced at all in some localities except when the disease breaks out in an epidemic.

How general occult glanders is spread is indicated by the fact that in a test of 200 horses in groups of ten from twenty different sections of the State of Connecticut 20 per cent were found to be affected, mostly without the suspicion of their owners, because the symptoms were internal, with no external manifestations.

Glanders Epidemic Cost $500,000

In one large eastern city it cost $500,000 to stamp out an epidemic of glanders that had been allowed to gain headway. Dr. Atwood secured the removal of the commissioner of domestic animals in Connecticut in 1912 after two New Haven citizens had died of the disease contracted from affected horses. He also cites a case of a horse in advanced stages of the disease which was used to haul a wagon that dispensed ice cream to school children in the city of New Haven.

The disease results from poor stable conditions and overwork primarily, although any healthy horse may be infected from drinking in a public fountain or a drinking pail which has been used by a glandered horse. The most serious cause of glanders is the customary method of stabling city horses. A horse normally requires an abundance of fresh air and clean surroundings. He should have an open lot kept reasonably clean to run in and pure air to breathe. These are practically impossible of attainment in large cities, and for economic reasons the likelihood of horses being overworked is great, especially in the winter months, when stabling conditions become most vile.

It is an established fact that cattle cannot exist in health when kept in city stables, and for this reason many large cities prohibit their keeping in built-up sections. Horses are equally sensitive, and yet are allowed to be kept in surroundings ideal for the production of glanders.

Malady Causes Great Suffering

The disease causes indescribable suffering in human beings and death by putrification, which is most revolting. While undeniably in certain classes of work the horse is a more economical transportation means than the motor truck, no amount of pecuniary saving can compensate for the production of this disease.

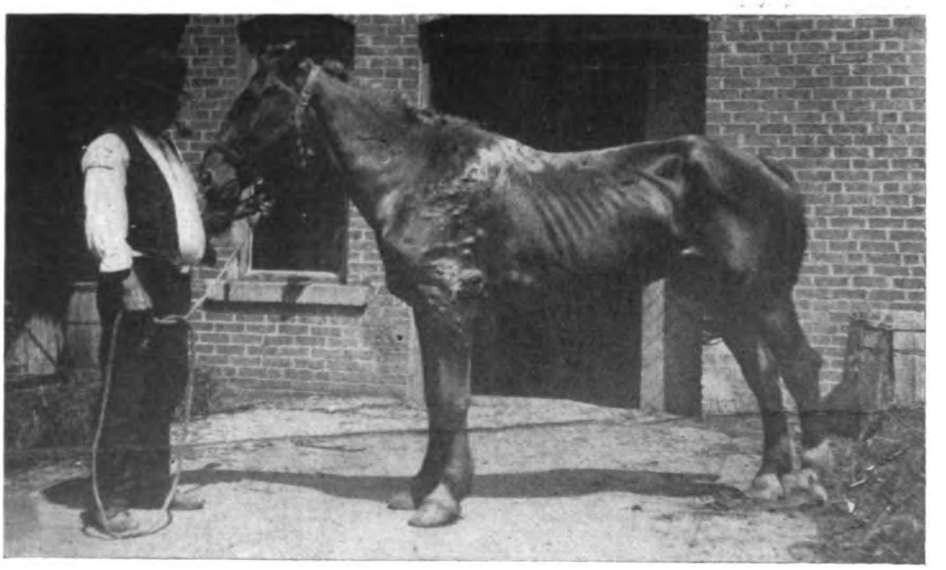
Even in antiquity the danger of glanders was recognized. Moses in the wilderness counselled his followers not to sleep in the stable when the horses snorted. To this Dr. Atwood adds:

"Glanders was recognized by Aristotle 350 B.C. It was also described by Apsyrtus in the fourth century. Later Dr. Solleysel recognized it as a contagious disease, and wrote that it was easily communicated." He continues

(*Continued on page* 23)

Better Truck Repairs

See Pages 16 and 17



Horse taken off a fruit wagon in New Haven, Conn., much of the fruit on which was of the kind which is never cooked and would be loaded with the deadly germs of glanders. In this particular case there was a blanket kept over the farcy sores and this prevented their showing for a while. When the photograph was taken the man would not stand back from the horse and said he did not believe there was any danger. Imagine how careless such a man would be in handling the fruit. The lumps on the horse's shoulders show some of the sores

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Service Is Keynote in Keeping Motor Trucks Successfully Sold

It Is More Important Than Guarantee

THE three essentials, or cardinal virtues, in the successful building and marketing of trucks are construction, guarantee and service, and the greatest of these is service.*

This statement is made with the full knowledge of the value of correct construction and dependable guarantee, but the finest piece of machinery that money, brains and skill can build—and the strongest guarantee that can be written—soon become useless junk and meaningless phrases if placed in careless, thoughtless and ignorant hands.

I doubt if there is any word used in connection with the motor industry which is more abused, which is brought into greater disrepute and which is directly instrumental in the making—or the breaking—of the men who are connected with this great industry than the word SERVICE.

The promise of service, explicit or implied, which always goes with the sale of a motor truck, is the foundation on which friendly and mutually profitable business relations are firmly and permanently established between the factory, the selling agency and the customer; or it is the sunken reef against which these interests are wrecked.

Service does not mean something for nothing, the average truck owner does not expect this; there is not a factory or selling agency in the world that can give it and remain in business and there is not the slightest danger of their being called upon to do so if their salesmen are fully instructed in the real meaning of the word SERVICE and they are honest and fair in their representation to their customers.

The customer has the right to expect, demand and receive prompt and efficient service in time of need. The value of his truck investment and often the success or failure of his business depends on the fitness of his truck to do the work for which he purchased it and this necessary ever ready fitness depends largely on three important factors:

1—The quality of the material entering into the construction of the truck, the assembly of the various parts in such a manner that their true relation to each other is maintained under all conditions, thus eliminating friction and vibration, and the ability and inclination of the factory to back up the guarantee which accompanies its finished product.

2—The exercise of good judgment on the part of the purchaser in selecting a truck suitable in size and construction for the special work he has to do. He must be sure that his truck is placed in the hands of a careful, competent, sober driver.

3—The integrity and ability of the selling agency to meet conditions as they may arise from time to time and to correctly interpret and apply the factory guarantee to the credit of the factory and the satisfaction of the customer.

The first of these factors depends upon the factory and it is for the selling agency and the customer to exercise due caution and make sufficient investigation in order that they may determine as to the exact conditions of the factory guarantee and the financial ability of the concern to fulfill the same.

At the factory only is it possible to make careful inspection and analyses of the various parts entering into the chassis, so this important detail must be left entirely in the factory hands and the material, construction and workmanship must be such that the finished product can be fully guaranteed.

It is not sufficient that the factory guarantee should provide for furnishing parts free to replace those which may, during the period of said guarantee, prove defective in material, workmanship or construction, but these parts should be furnished promptly, and to assure this prompt service, suitable arrangements should be made between the factory and selling agency so that a stock of parts should be kept on hand at the different agencies at all times, the amount of stock carried to be regulated by the number of trucks sold and to be cared for by the respective agencies.

In arranging this important detail, it should be remembered that this stock of parts is carried primarily for the purpose of making the factory guarantee good. The financial burden of carrying these parts should rest in part upon the factory and should be figured by them as an overhead expense to be reduced to a minimum by using every possible precaution to see that the material, construction and workmanship in every truck leaving the factory are as nearly perfect as human foresight and mechanical skill can make them.

This detail should be included in the fixed or overhead expenses of manufacture and the selling price of the truck should be placed at a figure to assure the manufacturer a reasonable profit, in order that he may be enabled to remain in business and be in a position to make his guarantee good whenever occasion requires. This is the kind of SERVICE and assistance that the customer and selling agency have a right to expect and receive from the factory.

The second of these factors is entirely in the hands of and under the direct control of the truck purchaser and depends on his judgment in selecting the type of truck best suited to his own business. His care and usage of it are responsible in a large degree for the serviceability of the truck to him and for the reputation of the truck itself, its manufacturer and selling agency within his circle of acquaintance.

Having received the truck in good condition, it is the owner's duty to exercise care and judgment in its use. He should first acquaint himself thoroughly with the general construction; know where every grease cup is located and why it was placed there; learn all about the entire oiling and cooling system; how to start, stop and change speeds with the least possible shock and strain to the mechanism; heed the factory's instructions regarding overloading and overspeeding, and to employ a sober, careful, capable driver.

That man, before being permitted to assume the care of the truck, should be carefully and fully informed in all matters pertaining to its care and handling. He should be carefully instructed regarding the speed at which the truck should be driven under varying loads and road conditions and warned to refrain from overloading and overspeeding. No truck built will stand up under such abuse and render a satisfactory account of itself; and as the tendency with the large majority of truck drivers is to overload and overspeed, great stress should be placed upon these important matters.

The next important service which the agent can perform is to investigate carefully the delivery or transportation problem of his prospective customer's business, and satisfy himself that his truck is suitable in capacity and general construction for the class of work under consideration.

The average truck purchaser is a business man who has won whatever degree of success he has attained through good judgment, hard work and honest dealings and he knows that the policy of something for nothing is not sound and cannot be permanent. Consequently he does not place much reliance in the salesman who is too prolific with promises which his good judgment tells him cannot be fulfilled.

*This very concise presentation of the necessity for providing good service if motor trucks are to stay successfully sold is a brief digest of a paper by W. H. Baker, treasurer and manager of the Baker Motor Sales Co., Cambridge, Mass., and was presented before the New England agents of Selden trucks. Mr. Baker sells Selden trucks.

Pages 16 and 17
This Issue
Will Save Money
for You

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The French Cama's Lesson for the U. S.

(*Continued from page* 20)

conditions, but that the individual drivers shall not be given a single tool more than is necessary. Wood models have been made of the tools which accompany each make of truck. These comprise a set of wrenches, screwdrivers, a couple of files, grease gun, oil can, big shifting spanner, valve remover, etc. They vary a little according to the makes, but in no case is an unnecessary tool supplied. In the carpenter shops tool-carrying boards are made for each type of truck. These are hardwood boards with the place of the tool scooped out, and leather to hold the tools in position, according to the plan generally adopted in workshops. These tool racks have to be hung in one of the lockers under the body overhang, and each man is responsible for his own tools. On inspection day the officer in charge can tell at a glance whether any tool is missing or not.

Economizing on Spare Parts

With the exception of a few spark plug washers, no spare parts are given to the drivers. It is found that this is the only satisfactory and economical way to handle vast fleets of army vehicles. To make each vehicle self contained the driver would have to be given a wasteful wealth of parts; if a selection is decided on, the probabilities are that on not more than 1 per cent of the occasions would the driver have the part required.

All spares are put in charge of the mechanics aboard the repair truck attached to the convoy. This stock includes everything liable to wear or breakage on active service. There are three sets of all ball-bearings used in the truck; front axle assembly, steering gear, two magnetos, magneto parts, carbureter and carbureter parts, a complete gearset, a radiator, crankshaft, camshaft, pistons, connecting rods, valves, valve springs, radiator hose, water pump, gaskets, bolts, nuts, washers, spark plugs and various small parts.

Spares Ingeniously Boxed

All these spares are packed in specially made boxes in such a way that they cannot deteriorate no matter how long they are kept out of use, and so that the mechanic can control his stock merely by glancing in the box. Spark plugs, for instance, are screwed into a shelf; valves are set up in a suitable sized hole, complete with spring and cotter. Inside the lid of each box is a printed list of the contents, and in addition the driver keeps a list of his stock and a record of all parts given out. On the sides of each box are four inverted U-forged irons to receive a couple of bars by means of which the biggest box can be conveniently handled by a couple of men. When operating from a fixed base the spare parts boxes can be stored with the knowledge that their contents cannot be tampered with, and when on the road they will all fit inside the repair truck.

Every truck going on active service carries two 50-litre drums of gasoline as a reserve supply—this being equivalent to about 26 gallons. The drums are a stout galvanized iron type used by the gasoline refiners and having a couple of screwed brass stoppers. They are laid on their sides in a special cradle under the overhanging portion of the truck body. They cannot roll or chafe, are not liable to leak, and are instantly available when required. It is understood that this supply shall be kept for emergencies, as, for instance, when an advance is made and the ordinary supply of gasoline cannot be brought up to keep pace with the convoy.

Book Reviews

"The Mechanical Handling and Storing of Materials," by George Frederick Zimmer, is one of the most complete treatises ever published on the handling and storing of materials such as coal, grain, ore, timber, etc., by automatic or semi-automatic machinery together with the various accessories used in the manipulation of such plants.

It is an especially well-gotten up book of 752 pages of 7½ by 10 inches, with more than 1000 line cuts and halftone illustrations, with a full page color plate opposite the title page.

The book is an enlarged and revised edition of "Mechanical Handling of Materials" by the same author, but which in addition includes the methods and machinery used for the storing or stocking, and conversely, the reclaiming of material, a subject formerly treated with secondary consideration but now so much bound up with mechanical handling that it is of equal importance.

The book is well indexed and is divided into six main divisions, including the Continuous Handling of Matter, Continuous Handling of Material by Pneumatic and Hydraulic Means, Intermittent Handling of Material, Unloading and Loading Appliances, Miscellaneous Installations and the Automatic Weighing of Materials.

The six main departments of the book are further divided into forty-four chapters, which include descriptions and illustrations of the various types of loaders, conveyors, casting machines, automatic feeding devices and the like. Under the division of Loading Appliances the discharging of material by means of skips and grabs, automatic transporters, bridge or cantilever cranes, the loading of vessels by means of barge or ship elevators, marine legs, self-emptying barges, unloading of railway cars, etc., are treated very extensively.

The book treats of the handling principally of large quantities of materials such as would be kept in large manufacturing plants and of work in unloading from ships, but does not take up any devices particularly adaptable for the efficient operation of motor trucks by means of reducing idle loading or unloading time. It is a book designed rather for the manufacturing engineer or executive than for the operator of motor trucks, although many of the ideas embraced could probably be used to advantage in the design of apparatus for use in connection with motor trucks.

Glanders Communicable to Human Beings

(*Continued from page* 21)

with this further eulogy of the sanitary advantages of a motor truck:

"At the present time nearly every State has provided for paying for horses suffering from glanders in order to stamp out this disease. The motor truck is the most logical medium for doing this because it keeps the horses in the country on the farms and they are not sent on long hauls and do not become so fatigued. It is the overwork and the poorly ventilated and crowded stables which city horses are forced to endure that cause this disease to make progress; but with the motor truck to take the horse's place, paying for all occult glandered horses, destroying same and disinfecting the stables where it is found, this deadly disease of man and beast can be stamped out.

"It has been found that potatoes which have been frosted in cold weather through slow delivery by horses are injurious as food, and many other food products are exposed and injured through slow delivery of horses in both cold and hot weather. Flies, the greatest means of disease distribution, are found breeding where horses are stabled. Rats are other disease distributors, and they are always found in a horse stable; but very seldom do you find flies and rats in a garage. The motor truck is one of the greatest aids to modern healthy transportation and should not be curbed by exorbitant State licenses."

Dr. Atwood practises his own preaching, for while he continues a large veterinary practice, he is the distributor of Atterbury trucks in New Haven, having converted many of his horse-using clients to motor delivery.

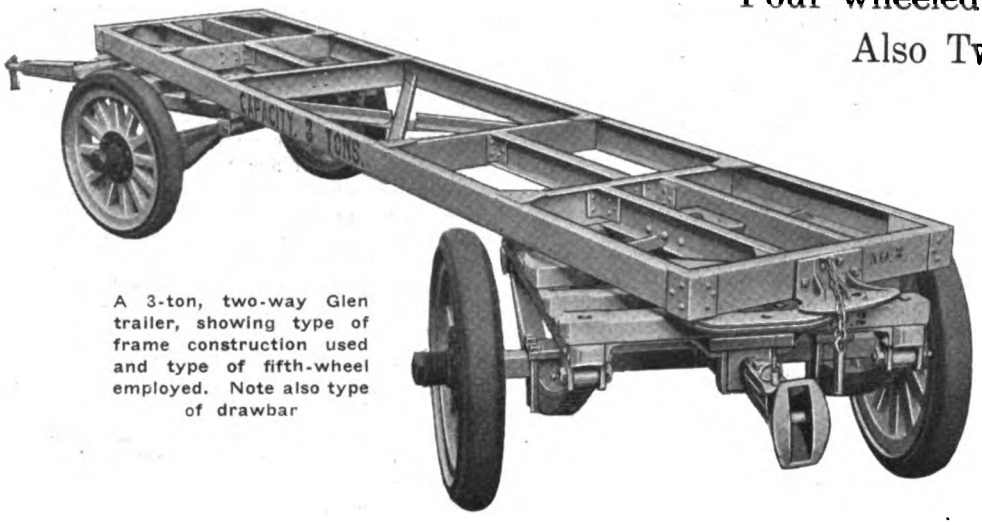
For those who are interested in a deeper study of human glanders and its malignancy, the Royal Victoria Hospital of Montreal, Que., Canada, has issued "A Study of Chronic Glanders in Man, with Report of a Case," by Dr. G. D. Robins, being an analysis of 156 cases collected from the literature and an appendix of the incidence of equine and human glanders in Canada.

Dr. Atwood presented a paper on "The Glanders Question in Connecticut" before the United States Live Stock Sanitary Assn., Feb. 16, 1915. In 1911 the American Medical Journal published an article on the care of human glanders as treated in Bellevue Hospital, New York City, prepared by Dr. William Park, director of the laboratory of the New York City Board of Health.

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Glen Truck Trailers for Almost Every Purpose

Four-wheeled Types from 1½ to 5 Tons—Also Twin and Semi-trailers



A 3-ton, two-way Glen trailer, showing type of frame construction used and type of fifth-wheel employed. Note also type of drawbar

GLEN motor truck trailers are made in models for almost every purpose. Manufactured for the past 10 years by the Glen Wagon & Car Corp., Cortland, N. Y., they are offered in four-wheeled types of both the reversible and irreversible design in capacities from 1½ to 5 tons and with either steel or wood wheels and steel or rubber tires; in 10-ton twin trailers of the two-wheeled type and in semi-trailers for use behind tractors fitted with fifth-wheel mountings. The Glen company also manufactures bottom-dump wagon-like trailers suitable for use behind tractor engines or in long trains behind motor tractors employed in road construction work. In addition, the Glen company also offers a complete line of trailer bodies for every service.

Four-Wheeled Trailers

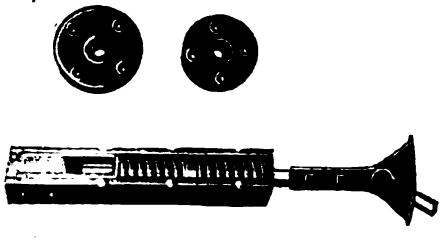
The four-wheeled trailers follow the same general design with the exception of the necessary changes to be made to make the irreversible into the reversible type and for the use of special wheels of wood or steel or with steel or rubber tires. The frames of the four-wheeled truck type trailers are made of channel steel sections with five channel cross members suitably gusseted at both ends and provided with longitudinal stiffeners at each end to carry the fifth-wheel bolster plates by means of which either set of wheels is made to turn in following the hauling vehicle. This bolster is provided with a special king pin which holds the wheel trucks firm but still permits them to turn as required.

The smallest of this type of trailer is a 1½-ton, one-way model designed for handling general merchandise behind light delivery trucks. The rear axle is held firm and the springs attached to shackles fastened to bolsters are bolted to the steel frame. The frame is a 4-in. channel, 11 ft. long and 37 in. wide. The wheels of standard equipment are wood, 32 in. in diameter, with 2½-in. solid tires and are mounted on a 1½-in. square steel axle with Bower roller bearings. The next larger model is a 2-tonner which follows the 1½-ton model very closely in design except for a slight increase in the strength of the load-carrying parts and the tires.

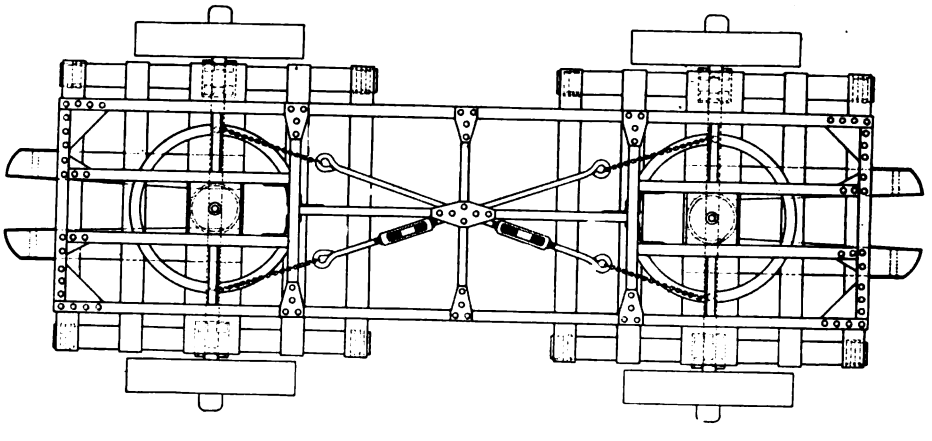
A 3-ton, two-way trailer is also offered. It follows the outline of the smaller models except that it has a fifth-wheel bolster plate on both ends instead of only at the front. Its frame is a 5-in. steel channel 38 in. wide and 14 ft. long. It may be fitted with 36 by 4-in. solid tires or 4 by ¾-in. soft steel tires as desired. A very similar model of 5-ton capacity is also produced.

Three- and Five-Ton Trailers

Three- and 5-ton two-way trailers, similar to the model just previously described, are also made and differ in that they are intended for use in hot, dry climates. They are provided with steel wheels with drawn steel hubs and spokes dove-tailed and upset in the rims and hubs. Solid rubber tires 4 by 36 in. on the 3-tonner and 6 by 36 in. on the 5-tonner are provided and are fastened with an expansion steel wedge adjusted by bolts in the rim on the wheel, so that each tire can be put on or taken off quickly with a wrench. The axles are of I-beam section, 4 by 3 in. reinforced with 2½-in. steel channels and equipped with 4 by 8 steel roller bearings oiled through self-closed oil cups on the hubs of the wheels in the case of the 3-ton model and with two sets of 4 by 5½-in. roller bearings similarly oiled on the 5-tonner. The track of the 3-ton model is 60 in. and that of the 5-ton, 61 in. Both of these models can be run at a speed of from 15 to 25 m.p.h. and can be fitted with any type of body 14 ft. long.



At the top, the special male and female bolster plates used on Glen trailers. The king pin drops through the hole in the boss on the disk at the right. When in place, the boss takes the pulling strain instead of the pin



Plan view of the tracking device of the double-ended Glen trailer. Note the chains wound partly around the fifth wheels and the connecting turnbuckles, which mechanism causes both sets of trailer wheels to track in rounding corners

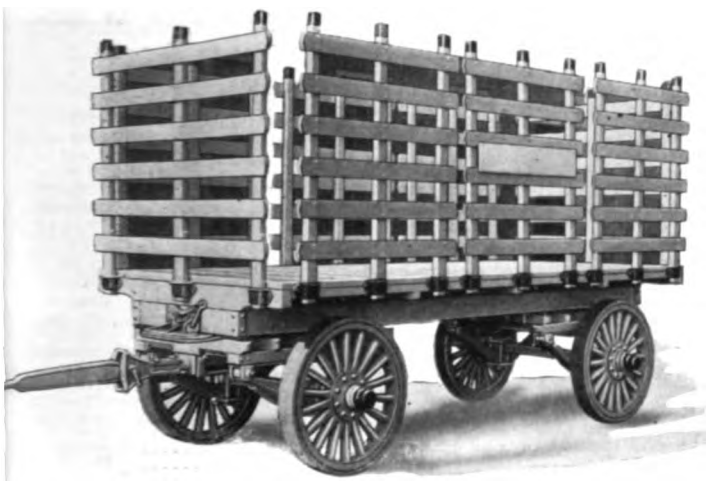
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A Glen 5-ton model with steel spoke wheels and side-dump body



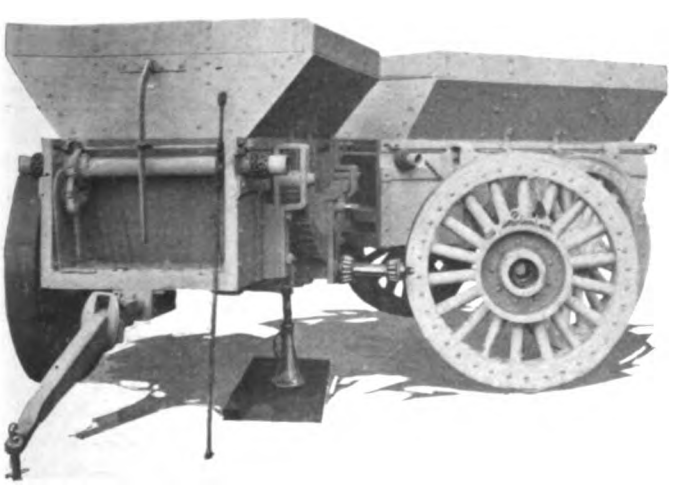
Another 5-ton model built for hot climates and provided with steel spoke wheels and steel tires. It will stand speeds of from 6 to 8 miles per hour with full load



A Glen 5-tonner with wood wheels and 5 by 1 in. soft steel tires. It is of the two-way type and has mounted on it a racked stake body made by the Glen company

A 5-ton four-wheeled trailer differing from the type just described is also made. It differs in that it has wagon-like steel wheels for speeds of from 6 to 8 m.p.h. and is provided with a reach between the front and rear axles and turnbuckles with chains around the fifth-wheels, so that the trailer wheels track with those of the vehicle when rounding corners. The construction of this self-tracking device is shown clearly in the sketch at the bottom of the opposite page.

The twin trailers are designed particularly for hauling ore or like substances at mines. Each trailer is capable of carrying 5 tons, so that a pair will haul 10 tons total. They are provided with flareboard bodies of the bottom-dump type and are mounted on 3½-in. square steel axles with plain spindles and bronze boxes. Each unit is carried on Resista half elliptic springs 60 in. long and 4 in. wide, with hardened-steel shackle pins, bronze bushings and compression grease cups. The wheels are of the Sarven type, 4 ft. in diameter with 6- or 8-in. soft steel tires 1 in. thick with a 3/16-in. sweat band underneath.



A pair of 5-ton twin trailers, one with its wheels removed to show the Timken roller bearings, method of spring mounting, drawbar, bottom opening chain arbor and large brake drums on the wheel

Drum brakes are provided on each wheel. The drums are 18 in. in diameter and 4 in. wide. The brakes, which are of the outside band type, are operated by steel bars along each side of the body, with arms running to brake levers, which are joined to an extra lever on the driver's seat of the hauling vehicle. The bottoms of the trailer bodies are open and closed by chains running over rollers on each side of the body to a winding arbor at the front. These twin trailers are often used in sets of two pairs each and are capable of hauling 20 tons at one time and yet carrying only 5 tons on each pair of wheels.

The Glen company also manufactures semi-trailers for use behind short-wheelbase tractors and carry approximately two-thirds of the load on the steel-tired trailer wheels and the balance on the tractor.

Various types of bodies for use on Glen trailers are manufactured and include side-dump bodies for sand, gravel, or crushed stone; a rack-sided stake body; canvas-covered army transport body; a plain stake body; an express body with flareboards; a screen-sided type with end gates and side doors for coke and paper; an express body with end gates for produce and a flaring rack body for sugar cane, fodder, etc.

The drawbars used in connection with Glen trailers are of the spring type. They are made somewhat along railroad practice and are furnished with bell-mouthed castings at the ends in which the locking links are inserted. The drawbar itself is able to turn on its own axis to prevent undue strains when traveling on rough roads, while the use of the bell-mouthed castings permits the trailers to mount obstructions or drop into depressions in the roads without binding.

The bolster plates used on Glen trailers are of special manufacture and consist of two plates made up on the plan of a male and female joint as shown in the two pictured directly above the spring drawbar on the opposite page. The plate at the right is the one attached to the trailer frame. It has a center hole and a boss through which the king pin drops. When the boss drops down into the similar-sized recess in the plate on the axle framework, the boss takes the pulling strain instead of the king pin, thereby keeping the truck in perfect alignment.

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The Readers' Forum

Devoted to topics pertinent to commercial vehicle operation, design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

COST FIGURES OF 3-TON TRUCKS

Detroit Investigator Seeks Operating Cost of Large Trucks

To the Editor, COMMERCIAL VEHICLE:

Will you please furnish me with whatever cost figures you have available concerning motor trucks of 3-ton capacity and over.—J. B. P., Detroit.

Below you will find some few examples of cost figures on trucks of 3-ton capacity and over. In endeavoring to draw up any comparisons between these figures we would especially call your attention to the fact that due to a lack of uniformity of basis upon which these figures are calculated, many considerations must be taken into account in an attempt to compare the cost of one truck installation with that of another. THE COMMERCIAL VEHICLE found this lack of uniformity in figuring motor truck costs and as a result spent several years in perfecting a standard cost-keeping system for motor trucks. We believe that this system is applicable in all cases, because calculations determined upon the basis of it will be directly comparable, after allowances have been made for any operating conditions peculiar to the particular cities in which any of the installations may be working. In fact, careful consideration must be used in attempting to compare cost figures of more than one installation even in the same city for reasons of road surfaces, speeds due to traffic hold-ups and even the classes of work in which trucks are engaged. Complete details of THE COMMERCIAL VEHICLE Standard Cost System for Motor Trucks were published in the June 1, 1916, issue.

PIERCE-ARROW 5-TON TRUCK

The following costs cover the operation of a 5-ton Pierce-Arrow truck owned by the Capitol City Lumber Co., Hartford, Conn., during a 4 months' period in 1913:

Total investment with roller body	$5,362.12
Total expense per day	15.26
Average mileage per day	42.25
Average load of dressed lumber, feet	5,000
Average weight per load, tons	5
Carrying total per day, feet	42,500
Total expense per 1000 ft. delivered	$0.36

KISSELKAR 3-TON TRUCK

The following figures cover the cost of operation of a 3-ton Kisselkar truck owned by the Plankinton Packing Co., Milwaukee, Wis., during the year ended October 5, 1913:

Actual days worked	305
Miles	7,393
Weight handled	6,574,474
Labor, total	$836.34
Gasoline	192.07
Oil	50.00
Supplies	28.09
Engine repairs	.85
Gearset repairs	2.50
Tire repairs	214.08
Other repairs, including daily washing	150.46
Interest and insurance	239.72
Depreciation, 15 per cent	449 80
Total	$2,190 97
Cost per mile	$0.29
Cost per day	7.18
Miles per gallon gasoline	4.62

COST OF TRUCKS IN COAL BUSINESS

H. Landgraf, assistant secretary, Philadelphia Coal Exchange, is authority for the following costs of motor trucks in hauling coal in Philadelphia during the year 1911:

7-TON TRUCK

Gasoline, 4 cents per mile	$2.00
Oil, 1½ cents per mile	.75
Repairs and renewals, 3 cents per mile	1.50
Tire maintenance, 7 cents per mile, with a tire guarantee of 6000 to 8000 miles	3.50
Driver, average $20 per week	3.74
Depreciation, 10 per cent (300-day year)	1.90
Interest and insurance	1 48
Total operating cost per day, average 50 miles	$14.47

5-TON TRUCK

The following figures cover the cost of operation of a 5-ton truck over a period of 106 working days in 1911-1912:

5-TON TRUCK

Gasoline, 1354 gal. at 13 cents	$176.02
Oil, 129.5 gal. at 35 cents	45.33
Driver's wages and helper, 4 months	432.00
Storage, 4 months	80.00
Tires, based on one set a year	210.23
Depreciation, 20 per cent on $4,750	316.67
Total cost	$1,260 25

Repairs on parts not given; insurance omitted; storage is rarely charged, it being provided at place of business.

Number of working days	106
Average daily load, tons	8.7
Average daily mileage	54
Cost per day	$11.89

4½-TON TRUCK

Investment	$5,000.00
Body	250.00
Total cost	5,250.00
Interest, 6 per cent on $5,250, less $700 for tires, $4,550	273.00
Depreciation body and equipment at 20 per cent	50.00
Storage, including washing, polishing and inspection 1 year	300.00
Driver's wages at $15 per week	780.00
Insurance: Fire, $99; liability, $80; property, $32; collision, $108	319.00
Annual expenditures for overhauling, renewing of parts, etc	500.00
Total fixed charges for 300-day year	2,222.00
Total fixed charges per day	7.41
Gasoline at 8½ cents per gallon per mile	0.0121
Oil at 30 cents per gallon, 200 miles, per mile	0.0015
Tires at $700 per set, per mile	0.0700
Total per mile	0.0836

Following are costs of several trucks as published in the March 1, 1915, issue of THE COMMERCIAL VEHICLE:

MONTHLY COSTS OF 3- AND 5-TON MOTOR TRUCKS

Item	A	B	C	D	E	F
Investment, truck and body	$4,300.00	$3,960.00	$5,250.00	$5,362.00	$4,764.00	$5,600 00
Gasoline	$17 90	$25.00	$15.12	.....	.....	$39.00
Oil and lubricants	1.36	5.00	1.88	.....	.....	9.62
Mechanics	.....	.....	.....	.....	.....	.....
Tires (based on guarantee)	52 12	50.00	116.67	.....	.....	79.25
Repairs (all)	1.36	18.75	41 67	.....	.....	11.78
Garaging	20.00*	20.00*	25.00	.....	$15.00	15.00*
Drivers	78.00	50.00	65.00	.....	86.30	107.80
Helpers	.....	.....	.....	.....	.....	.....
Miscellaneous	.....	.....	.....	.....	.....	.....
Maintenance (lump)	.....	.....	.....	$381.50	104.19	.....
Depreciation at 20 per cent	72.00	66.00	87.50	89.37	79.40	93.33
Interest at 6 per cent	21.50	19 90	26.25	26 81	23.82	28.00
Insurance (all)	18.33	18.75	26.58	.....	8.12	24.81
Total	$282.57	$273.40	$405.67	$497.68	$316.73	$408.59

*Items estimated by THE COMMERCIAL VEHICLE

A—3-ton coal truck (figures furnished by Philadelphia Coal Exchange) average 38.2 miles per day.

B—3-ton coal truck (figures furnished by Philadelphia Coal Exchange) average 50 miles per day.

C—4½-ton coal truck (figures furnished by Philadelphia Coal Exchange) average 50 miles per day.

D—5-ton Pierce-Arrow, Capitol City Lumber Co., Hartford, Conn., 42.5 miles per day.

E—5-ton Locomobile, Bridgeport Hydraulic Co., Bridgeport, Conn., average of two trucks for 5 months, 50 miles per day.

F—3-ton Mack, Cranford Co., Brooklyn, N. Y., 37.7 miles per day, period of 4 1-3 months.

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The following figures cover the cost of a 3-ton Garford truck converted into a tractor and hauling a semi-trailer of 6-ton capacity. The figures cover the month of August, 1916:

Cost of gasoline	$59.34
Gallons of gasoline	423
Cost of oil (pints used, 276)	$8.28
Cost of grease, 15 lb.	.90
Repair parts	33.66
Body repairs	1.25
Labor for repairs	33.45
Driver's wages	84.00
Depreciation of tires	25.50
Depreciation of truck, not figured	.....
Insurance	15.93
Storage, not figured	.....
Interest	20.00
Total operating expense	$282.11
Average daily mileage	66
Number of days worked	26
Cost per commercial ton-mile	$0.0273
Cost per absolute ton-mile	.0546

The following figures were compiled by W. Howard Clapp from trucks in use in California and included in the paper read by him before the Los Angeles, Cal., section of the American Society of Mechanical Engineers in 1916:

Item	5-Ton Truck	6½-Ton Truck
Cost	$4,600.00	$5,000.00
Miles per gal. gasoline	3.5	3.0
Daily mileage	50	50
Insurance, fire and liability	$11.45	$12.20
License fees and taxes	285.00	350.00
Interest at 6 per cent	18.45	19.50
Depreciation	4,140.00	4,500.00
Administration	360.00	380.00
Garaging	780.00	860.00
Gasoline at 16 cents per gallon	4,460.00	5,200.00
Oil, grease and waste	975.00	1,220.00
Tires, less first cost	3,600.00	4,050.00
Drivers' salaries	7,020.00	7,020.00
Inspection and maintenance	4,000.00	5,000.00
Total	$28,610.00	$31,750.00
Cost per day	14.67	16.35
Cost per mile	.297	.326
Estimated life of truck, years	6½	6½

The foregoing costs are in dollars for the entire life of the trucks.

5-TON GASOLINE TRACTOR

The following figures cover the cost of operation of a 5-ton gasoline tractor hauling a trailer carrying from 14,400 to 18,800 lb. This vehicle is used by the New York Street Cleaning Department in Brooklyn, New York. The figures cover a period of 1 year between 1914 and 1915.

Depreciation at 20 per cent	$960.00
Interest at 6 per cent	288.00
Maintenance	420.00
Tires	656.25
Gasoline	471.00
Oil and grease	131.25
	$2,926.50
Total mileage per year	10,500
Cost per ton-mile	$0.0743

The following figures cover the operation of the specified trucks of the Cranford Co., Brooklyn, N. Y., between July 25 to Nov. 30, 1910. The trucks were used in the haulage of street asphalt.

	Mack	Reliance	Hewitt
Cost	$5,600.00	$5,500.00	$5,950.00
Days operated	106	87	94
Days idle	22	41	34
Miles covered	3,997	3,092	2,955
Trips	420	333	386
Average tons per trip	584	563	633
Running repairs	$50.00	$50.00	$50.00
Oil	40.88	39.48	39.48
Gasoline	165.44	140.69	149.82
Driver	457.14	457.14	457.14
Tires	336.00	336.00	336.00
Insurance	87.68	87.68	87.68
Depreciation	392.70	385.79	417.28
Interest	117.88	115.71	125.18
Total expense	$1,647.72	$1,612.49	$1,662.58
Cost per day operated	15.54	18.53	17.69

5-TON WHITE TRUCK

The following cost figures cover the cost of operation of a 5-ton White truck in the New York Street Cleaning Department, Borough of the Bronx, New York City, collecting garbage and refuse in house-to-house work during 1914:

Gasoline	$2.415
Oil	.746
Truck depreciation, life 5 years, at cost of $5,000	2.777
Interest on investment at 6 per cent	.833
Repairs, labor and material, tires, grease and miscellaneous	4.068
Garage rent	.300
Driver pay per day	2.56
Three helpers at $2	6.00
Total	$19.699

3-TON WORM-DRIVEN RIKER

The average cost of two 3-ton Riker worm-driven trucks owned by the Warner Bros. Co., Bridgeport, Conn., and used in the overland haulage of corset parts between Bridgeport, Norwalk, Stamford and New Milford during 1916 are as follows:

Average mileage per year	15,000
Average trips per year	260
Average trip, mileage	57.7
Cost of total operation per mile	$0.40
Cost per year operated	$6,000.00
Cost per day	$16.44

The cost given above includes all charges, such as gasoline, oil, tires, repairs, both labor and material, drivers' and helpers' wages, depreciation, interest on investment, insurance, licenses, taxes and garage rent. With a full load of three tons in each direction, 57.7 miles per trip times 6 ton-miles, or 346.2 ton-miles are made each trip. This, multiplied by 260 trips, gives a total ton-mile of 90,012 per year. This, divided into $6,000, gives an average cost of 6.666 cents per commercial ton-mile.

MAKERS OF FORD WATER PUMPS

Names of Manufacturers of Ford Water Circulating Pumps Desired

To the Editor, COMMERCIAL VEHICLE:

Will you please give me the names of manufacturers making water circulating pumps to attach to the Ford engine?—W. R. McGOWEN, International Harvester Co. of America, Galesburg, Ill.

The concerns given below manufacture water circulating pumps designed for attachment to Ford engines:

Crum-Wiley Mfg. Co., Peru, Ind.

Motor Cooling System Co., Baltimore, Md.

Security Co., Pittsburgh, Pa.

Schilling Mfg. Co., Long Beach, Cal.

TRUCK SERVICE STATIONS

Information on Plant, Salesroom and Service Station Offices

To the Editor, COMMERCIAL VEHICLE:

In some of your previous issues I believe you published a plan of an up-to-date salesroom and office in a service station. Will you please refer me to the issue in which this or any similar articles were published?—Emerson Broyles, Salesmanager, Southwestern Motor Sales Co., Tulsa, Okla.

Motor truck service stations in which offices and salesrooms were incorporated were described in the following issues of THE COMMERCIAL VEHICLE:

"Service First in New Locomobile Branch," Feb. 15, 1914, pages 20-22.—This article describes and illustrates the service station of the Locomobile Co. in New York City, and besides gives considerable of the operating methods employed.

"Service Station Business Institution," April 15, 1914, pages 16-22.—This article also describes and illustrates a New York service station, in this case of the International Motor Co.

"New Gotham Autocar Service Station Model of Business Efficiency," April 15, 1915, pages 5-9.—Describes and illustrates the physical characteristics of the buildings.

FORD ADAPTER MAKERS

List of Ford Converter Manufacturers Brought Up to Date

To the Editor, COMMERCIAL VEHICLE:

Please mail us the names and addresses of the various concerns which manufacture adapters for converting passenger cars into motor trucks.—Fehrer Bros. Garage, Beaver Dam, Wis.

The following is an up-to-date list of converter makers:

Camelford, Maremont Mfg. Co., Chicago.
Convert-a-Car, Chicago Pneumatic Tool Co., Chicago.
Dearborn, Dearborn Truck Co., Chicago.
Evans, Automobile Mfg. & Eng. Co., Detroit.
Forbes, Walter J. Forbes, Boston, Mass.
Franklin Two-way, Franklin Two-way Converter Co., Chicago.
Goliath, Goliath Commercial Car Co., Chicago.
H-D, Hayes Diefenderfer Co., Inc., New York.
Hudford, Commercial Car Unit Co., Philadelphia, Pa.
Iowa, Iowa Motor Truck Co., Ottumwa, Iowa.
Indestructible, Indestructible Truck Sales Co., Chicago.
Jewett Attachment, The Jewett Car Co., Newark, Ohio.
Longford, Motor Accessory Distributing Co., Boston, Mass.
Mak-A-Tractor, E. G. Staude Mfg. Co., St. Paul, Minn.
Maxfer Ton-truck Maker, Maxfer Truck Co., Chicago.
Olson, The Swedish Crucible Steel Co., Detroit, Mich., and Windsor, Ontario.
Rayford, Rayford Co., Philadelphia, Pa.
Redden, Redden Motor Truck Co., Chicago.
Smith Form-a-Truck, Smith Form-a-Truck Co., Chicago.
Stableford, Stableford Truck Mfg. Co., Chicago.
Ton-a-Ford, Ton-a-Ford Truck Co., Racine, Wis.
Tonford, Detroit Truck Co., Detroit, Mich.
Ton-Ford, Woodward Truck Attachment Co., Los Angeles, Cal.
Truckford, Robinson Machine Co., Detroit, Mich.
Truckmobile, The Commercial Truckmobile Co., Chicago.
Tructor, Tructor Mfg. Co., Chicago.
Union, Union Truck Mfg. Co., Inc., New York.
Unity, Unity Motor Truck Co., Cleveland, Ohio.
Utility, The Utility Motor Truck Co., Chicago.
Will-Holl, Wilson Holland Mfg. Co., Detroit.
Wright, Wright Truck Attachment Co., Seattle, Wash.

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Quick-unloading Bodies Save Idle Time

One Dumps 5,000 Bricks and Another Discharges at Both Sides

Stock Bodies for Adapted Fords and a Modern Paymaster's Office on Wheels

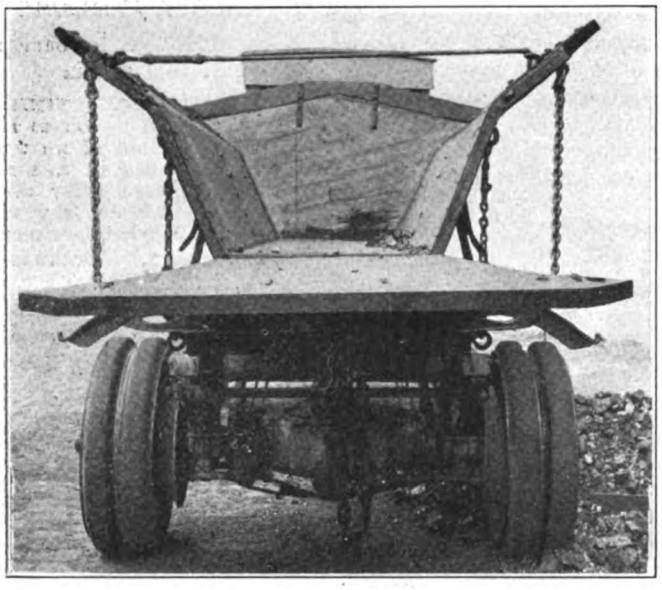


Fig. 1—The Lee flat-bottomed two-way dump body designed to carry all kinds of goods, both bulk and package

Modern Paymasters Travel in Speedy Truck Offices

EQUIPPED with every modern convenience of the up-to-date bank office and protected against highway bandits, the latest aid to paymasters who have to travel over widely scattered districts is a specially constructed body mounted on a White 1500-lb. truck chassis. It is shown, exterior and interior, in Fig. 2, and is owned by the Chicago Surface Railway Lines and used to carry the pay envelopes of thousands of its employees to the car barns and other widely scattered points where construction work of different kinds is being carried on.

In some instances the truck acts merely as a vehicle to transport paymasters and large sums of money from one car barn to another. In some such cases the money is removed from the truck body and paid out through the regular offices in the barn.

At other times the truck makes trips of several miles into the country districts to pay off the line and track men and gangs engaged in special construction work, such as the building of new bridges, tunnels, culverts, small buildings and general track improvements. In this work the men are paid directly from the truck body.

The truck has accommodations for four paymasters, a driver and a guard, all of whom go heavily armed. The driver and the guard sit on the front seat in the cab of the vehicle, which is enclosed and provided with two side windows and a door on the right. The driver's cab is a separate compartment from that for the paymasters in the rear. The latter is reached by a separate door, also on the right side. Each of the paymasters works at a table which is hinged to the side of the body below the windows. These tables may be swung down flat with the body side when not in use. Each paymaster also has his own individual swivel chair, as shown in the interior view in Fig. 2.

Besides the four hinged tables and four swivel chairs, there are a large table in the center of the office and a special steel vault built in the body of the truck behind the driver's seat. The center table is used for making up payrolls while the truck is en route. On either side of the center table are shelves for money trays which can be easily reached by the paymasters when sitting at the center table. When the truck is traveling through the streets all the money and other valuables are carried in the special steel vault.

In paying direct from the truck the chief paymaster sits at the extreme end of the office, takes the pay envelopes from the shelf and passes them out to the workmen through a grating in the rear body window on the left. While the men are receiving their money the guard stands on duty in the rear of the office and the driver protects the front.

The interior of the body is extremely light, there being three large windows on each side, one in the door on the right and two more in the rear end. These windows are protected by iron bar gratings which are connected up with an alarm system so that any one tampering with them when the glass panes are down can be detected at once.

New Parry Body Types for Adapted Fords

THE present popularity of Ford chassis converted into 1-ton trucks or thereabouts by use of one of the score or more Ford adapters now on the market has created a demand for ready-made bodies to be fitted on such vehicles. Most of the Ford adapters are enabled to carry a larger load by the lengthening of the regular Ford chassis through the addition of some form of telescoping or overlapping frame, which in most cases increases the wheelbase of the Ford chassis and requires bodies of greater length than those used on the conventional Ford.

One company which is manufacturing a line of bodies particularly adapted to the converted Ford chassis is the Parry

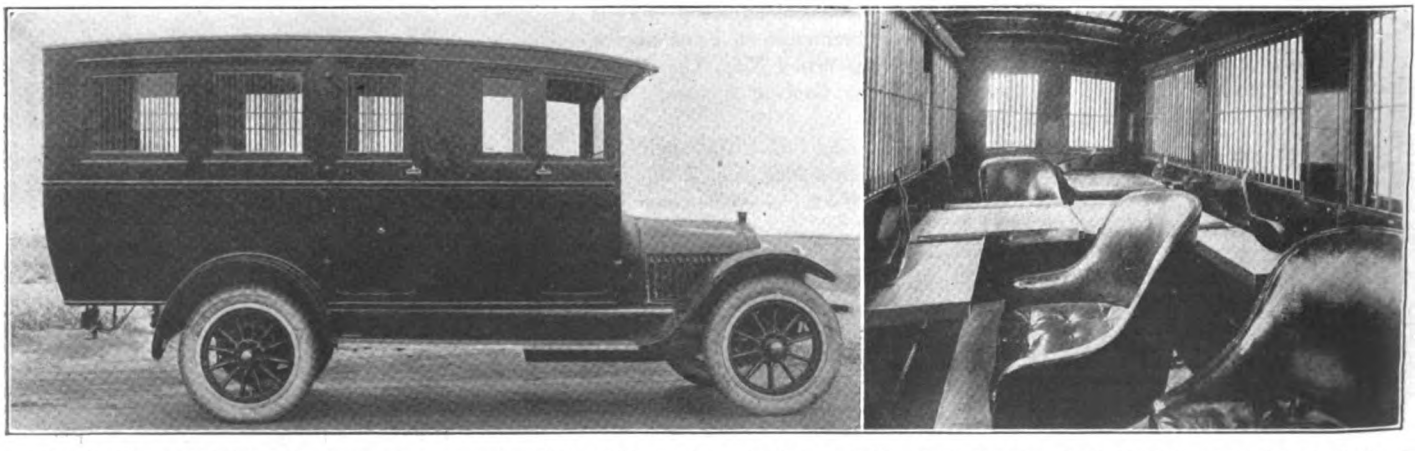


Fig. 2—The latest thing for paymasters is a luxurious office on the wheels of a motor truck chassis. It does not have to depend upon steel rails. Its body is armored for protection against robbers

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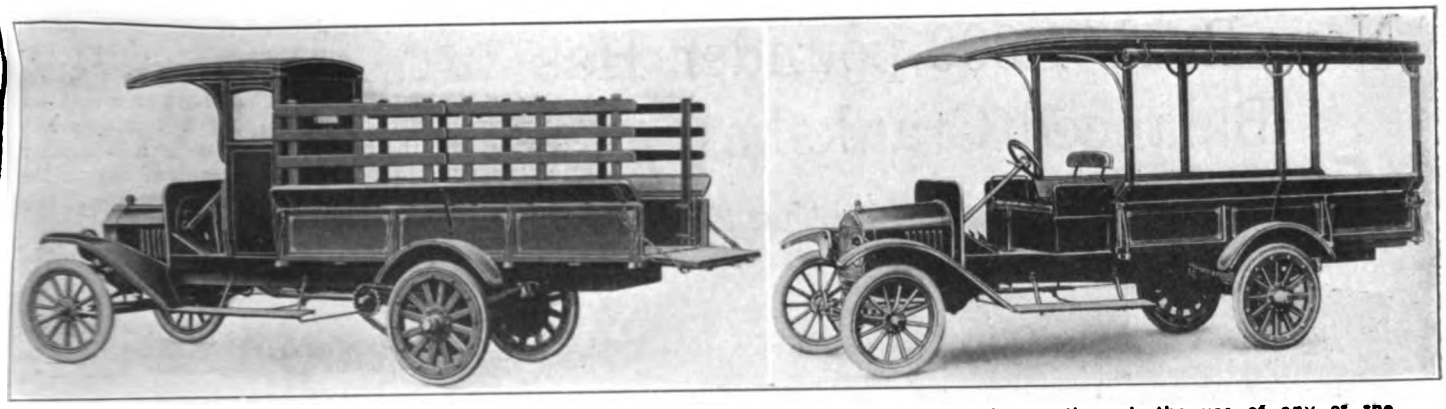


Fig. 3—Two of the Parry bodies built as standard units for Fords with increased wheelbases through the use of any of the converters or adapters now on the market

Mfg. Co., Indianapolis, Ind. The Parry line consists of a complete assortment of standard models to fit practically every business need.

The styles offered include an open express body with cab seat and top; an open express body with skeleton seat; a six-post express body with top and side and end roll curtains; an express body of the flareboard type with a top; a similar model with removable passenger seats; an express body with removable side stakes; two platform bodies, one with removable stakes and another with removable sideboard racks, and a short-length express body to be used behind a converted vehicle of the roadster type in which the regular Ford seat and top are retained. The express body with removable side stakes and the express body with flareboards and top with side and end roll curtain are shown in Fig. 3.

Parry bodies are made of maple and are manufactured in quantities and shipped crated as ordered. Before shipment they are set up so that it is certain each part fits in its proper place.

All of the models except the two platform types have clear loading spaces of 45 by 110 in. The two platform types are slightly longer and extend over the sides of the rear wheels, the clear width inside being 60 in. and the length 112 in. The regular equipment furnished on all models includes full-width seats and cushions and roll-up curtains on those models with tops. Rear fenders, fore doors on the cab and filler boards are sold as extras, as are also windshields and driver's storm curtains.

The Parry company also offers a neat set of heavy black oiled duck cab curtains with large celluloid windows affording a clear vision on both sides of the driver. The curtain on the right is made in two sections to enable the driver to get in and out readily. When not in use the curtains are rolled up and held by straps under the cab roof.

New Lee General-purpose Body Dumps to Side or End

DIFFERING from the previous models of two- or three-way bodies made by the Lee Loader & Body Co., Chicago, the latest or general-purpose type has a flat bottom instead of a round one. This does not prevent the new body from being dumped to the side or to the rear for the reason that the difference in shape has been compensated for by an increased curvature in the patented rolling rails by which the body can be dumped to either side as desired.

The new type is built in all sizes from 1 to 6 yd. capacity, and is made to fit any type of truck chassis, trailer or wagon gear. The body shown in Fig. 1 is mounted on a 3½-ton Standard chassis at present engaged in hauling coal to one of the municipal pumping stations in Chicago.

Besides the feature of the side and end unloading of Lee bodies, the latest design has the additional advantage of being able to carry a larger line of commodities more easily because of its flat bottom. A truck equipped with such a body can be used equally well for hauling loose materials such as sand, gravel, coal, crushed stone, etc., and lumber, barrels, etc., and in fact almost any commodity which must be handled over the roads.

As shown in Fig. 1, the new type of body has a narrow flat floor with two-angle flaring sides. It also has a flat tailgate which can be hinged at the bottom as shown or at the top, according to the kind of materials the truck on which it is fitted is to haul. Side chains prevent the door from dropping to a vertical position when open, although this can be accomplished if so desired by making the holding chains longer. The act of dumping the body to either side is done quickly and easily by the truck operator or his helper by simply releasing a handle holding a hinged support on either side. This is then swung down out of the way and a catch released, after which the body may be tipped to either side by gravity when once started by a push of the hand.

Tractor-trailer Unit Hauls and Dumps 5,000 Bricks

DESIGNED to overcome the difficulty of excessive idle time required to unload bricks to prevent breakage, the latest type of motor to do the job is a tractor with a self-dumping semi-trailer capable of carrying 5000 bricks at once. The unit is owned by the Standard Building Supply Co., New York City, and consists of a close-coupled Garford tractor and a Shadbolt semi-trailer. The trailer body is low and wide, with flaring sides, and is raised and lowered by means of a series of chains driven by a power winch carried directly aft the driver's seat and operated from the power of the engine.

As shown in Fig. 4, the trailer body is mounted on a trailer sub-frame on which is supported the upper half of the fifth-wheel, whereby the tractor carries its share of the trailer load. The chain from the winch leads under the fifth-wheel to a yoke or equalizer on the bottom of two trailer body crankarms pivoted to the main trailer sub-frame. Taking up on the chain elevates these arms so that the body is raised in proportion and the load of bricks slid off the end in a pile and with but very little breakage.

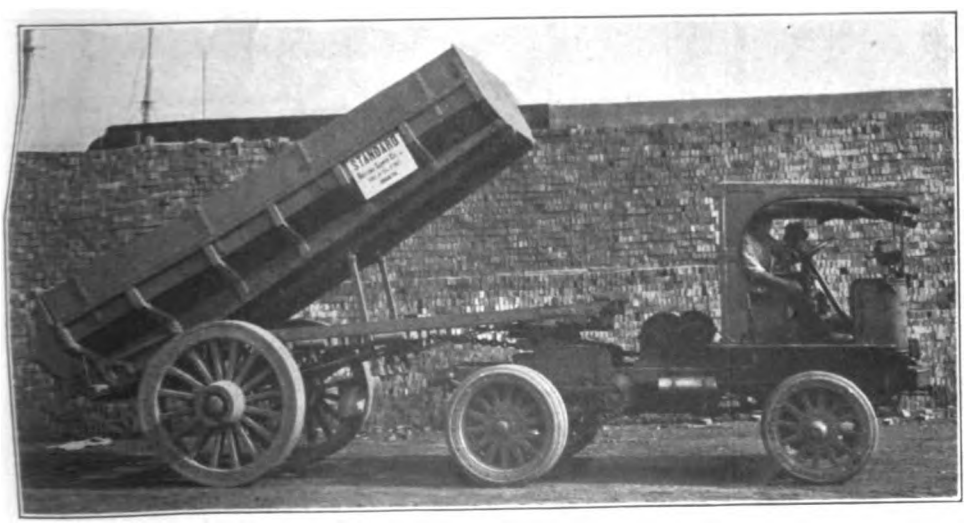
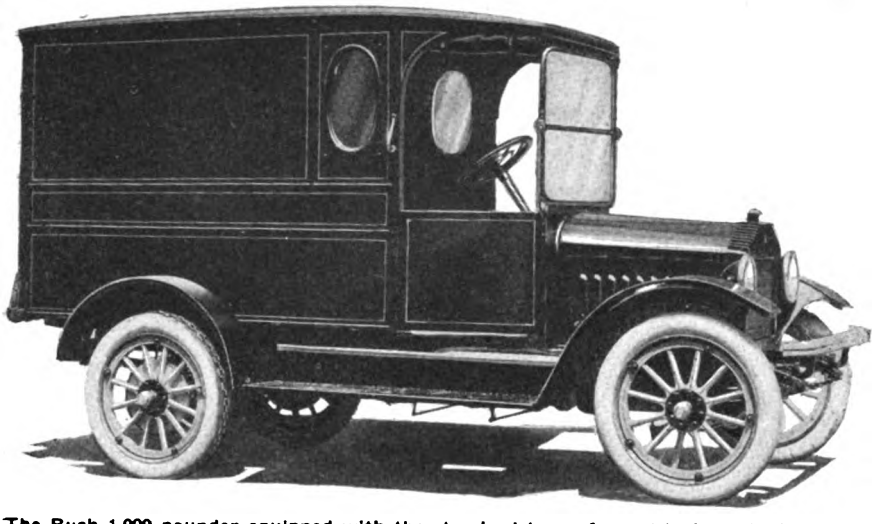


Fig. 4—This self-dumping semi-trailer carries and dumps 5,000 bricks. The chain winch for raising the body is operated by the tractor engine power

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New Rush 1,000-pounder Has Balanced Crankshaft

Also Complete Starting and Lighting Equipment



The Rush 1,000-pounder equipped with the standard type of panel body and which sells complete for $870. It may also be had with a six-post express body with top for $845

CHARACTERIZED by being the only light delivery vehicle having an engine with a counterbalanced crankshaft, the Rush 1000-pounder, made by the Rush Motor Truck Co., Philadelphia, Pa., is further characterized by an electrical starting and lighting outfit as standard equipment and by the completeness of its fittings and accessories which leave the owner with practically no equipment to buy before putting his vehicle into service. The engine, which is of Lycoming manufacture, is the same as the 3¼ by 5 model made by that company except for the counterbalanced crankshaft, which is a special feature of the Rush vehicle designed to make for long life of motor and chassis by reason of the elimination of the engine vibration. The counterbalanced weights which are shown in one of the accompanying illustrations are drop forged on the cheeks of the cranks, except that in the center, which equals in weight that of the two on the ends of the crank. These weights tend to produce an engine of even turning moment with the vibration periods at high speeds reduced to a minimum.

RUSH SPECIFICATIONS

Capacity, lbs.	1,000
Price	$750
Wheelbase, in.	105
Tires, front	31x4
rear	31x4
Bore, in.	3¼
Stroke, in.	5
N. A. C. C. hp.	16.2
Speed, r.p.m.	
m.p.h.	
Gear ratio, in high gear	5 to 1
Final drive	Bevel

The electrical starting and lighting equipment is a two-unit system employing a Splitdorf generator and a Willard storage battery. The electric headlights furnished with the outfit are provided with the regular large bulbs and smaller ones to be used as dimmers when the vehicle is operated on congested city streets.

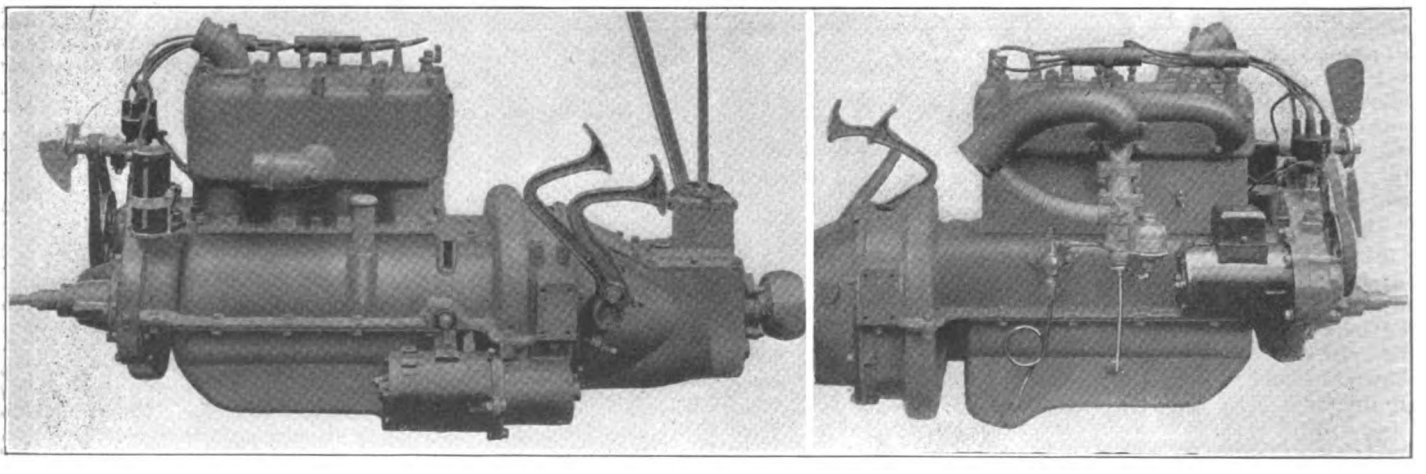
The accessories furnished as standard equipment with the chassis include a set of special shock absorbers placed around the rear axle and joined to the chassis frame; a simple yet substantial tire rack on the left runningboard; a Klaxon horn and an angle-iron bumper and a complete set of tools, including a jack, a series of wrenches, tire tools and hand air pump.

The vehicle is offered in the chassis or with two types of bodies. The complete vehicle with a standard panel body is sold at $870 and with a six-post flareboard express body with cab and fore doors at $845.

Except for the rear axle assembly, which is put together at the Rush plant, the vehicle is an assembled unit, although the Rush company manufactures many of the smaller component parts, such as the shock absorbers, engine bonnets, radiator cases, bumpers, universal joints and brackets such as used for the runningboard and the storage battery supports.

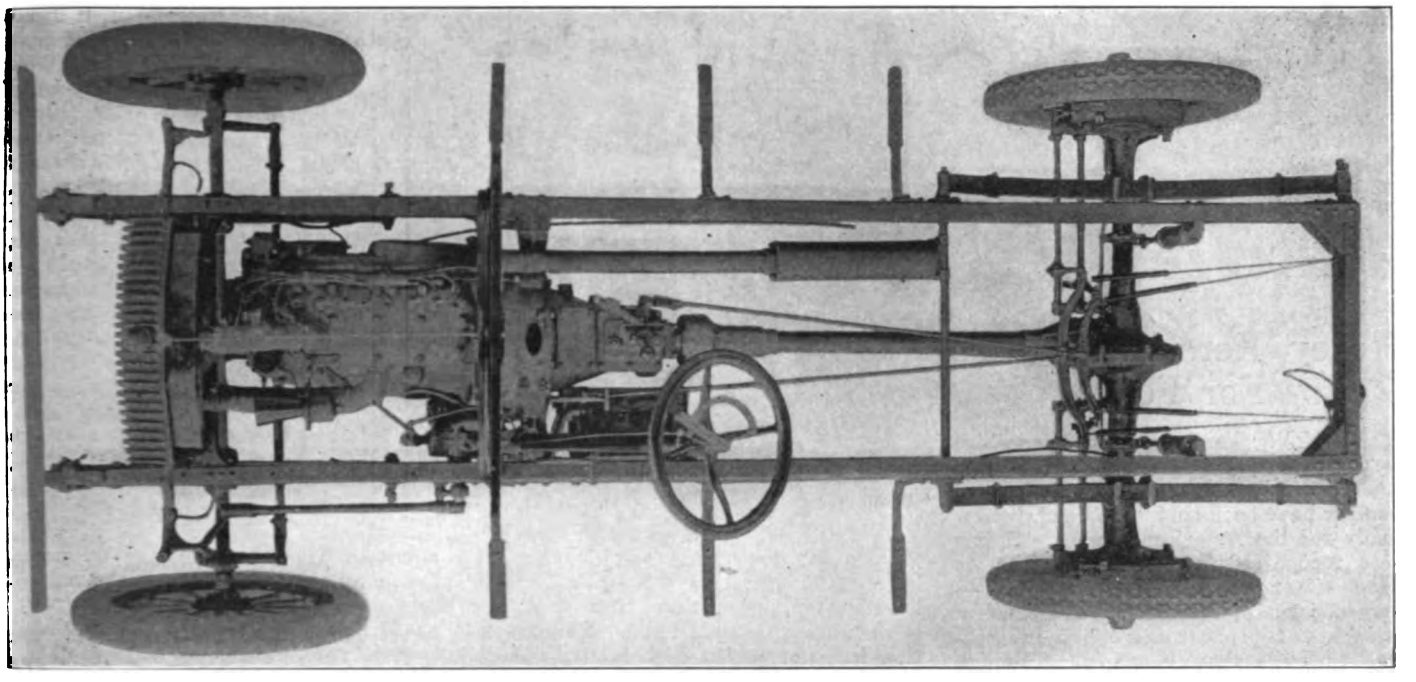
The engine is a Lycoming, 3¼ by 5, and is placed under an ordinary hood forward of the dash. Except for the counterbalanced crankshaft it follows standard Lycoming practice and has its cylinders cast in block with the valves at the right. It is thermo-syphon cooled in connection with a vertical finned-tube radiator with a cast case having fins at the top of the upper tank, as shown in the plan view of the chassis on the opposite page. It is fitted with a Carter carbureter fed by gravity from a 10-gallon tank under the driver's seat.

The electrical equipment consists of a two-unit starting, lighting and ignition outfit employing a Splitdorf generator and a Willard storage battery. The battery is carried in special brackets on the left of the chassis frame between the



Left and right sides of the Lycoming motor used on the Rush 1,000-pounder. This engine is the standard Lycoming 3¼ by 5 model, except that it is fitted with a counterbalanced crankshaft as shown on the opposite page. The counterbalanced crankshaft is designed to produce a motor of more even turning moment and less vibration, making for a longer engine and chassis life

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Plan view of the Rush chassis, showing the unit powerplant, cast-case radiator with fins on the top tank, left steer and center control and the bevel-driven rear axle. Note also the Klaxon horn on the left side of the engine and the Willard storage battery supported from the frame on the left side opposite the gearset, and the special shock-absorbers on rear axle

gearset and the side frame member. From the motor the drive is taken through a dry-multiple-disk clutch of Borg & Beck manufacture mounted in a unit with a selective sliding gearset with three speeds forward and one reverse. From the gearset the drive is taken through a single shaft inserted within a torque tube fitted with a special Rush universal joint at its front end and thence to the direct-bevel-driven rear axle.

Both sets of brakes are on the rear wheels, the hand set being external contracting and the foot set internal expanding. Both sets are 14 in. in diameter and 1¾ in. wide. The frame, which has been made by the J. G. Brill Co., Philadelphia, Pa., is of pressed steel in the semi-flexible type. It is of channel section, 3½ in. deep, 2¼ in. wide and 5 32 in. thick. The cross members are pressed steel, hot riveted, with integral gussets. The frame overhangs the rear axle by 40 in. The wheels are of wood all around and are made by Hoopes Bros. & Darlington. Tires are pneumatic both front and rear, the latter being furnished with a deformed tread. The Lavine steering gear, of the irreversible split nut type, is inclined at the left and the gearset and handbrake levers located in the center.

The panel and open express types of bodies offered by the Rush company are designed to meet the requirements of the average small merchant, for which the vehicle is especially adapted, as shown in the complete outfit illustrated on the opposite page. The panel body has an oval window at each end of the driver's seat, and is provided with a conventional windshield and fore doors. The express body is furnished with a conventional top with side and end roll curtains to protect the goods carried in inclement weather. Both bodies have a loading space of 72 in. back of the driver's seat.

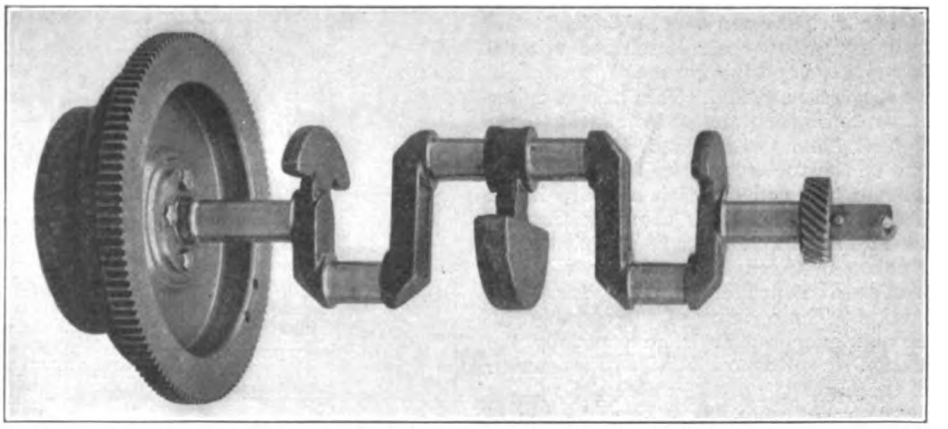
Be a Field Editor *for* THE COMMERCIAL VEHICLE Pages 16 and 17 Tell How

Book Reviews

"Tractor Bearings" is the title of a booklet recently issued by the Hyatt Roller Bearing Co., Chicago. It contains 36 pages of engineering discussion on anti-friction bearings as applied to tractors. One section of the booklet is devoted to a listing of combined tractor and harvester manufacturers using anti-friction bearings in their 1917 output.

"Bearing on Bearings, Vol. 3," published by the Gurney Ball Bearing Co., Jamestown, N. Y., is a booklet outlining the need of ball bearings and giving the arguments in favor of the Gurney variety. It is printed on heavy coated paper and illustrated with photographs and diagrams of Gurney bearings.

"A Pointer to Profits" has been issued by the Cadillac Auto Truck Co. to show how Acme trucks may make money for their owners. One-third of this booklet is devoted to general information on the use of the Acme vehicle in commercial service. The remainder is given to detailed specifications of the three Acme chassis and the Acme bodies. A serviceable feature of the catalog is the table of weights of materials per cubic foot. By means of this table the driver can tell the weight of his load if he has a ruler, without needing scales. There is also a table of the weights of miscellaneous materials. For instance, a barrel of beer weighs 390 lb., building brick per M. 4500 lb., flour per bbl. 200 lb. The weight of lumber per 1000 ft. is also given.



The feature of the Rush vehicle, the counterbalanced crankshaft. Note the two smaller weights on the cheeks of the two end cranks and the larger weight in the center. The crankshaft is of the two-bearing type, with the bearings at the ends as shown

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Accessories for the Truck

Holley Kerosene Device For Fords

THE Holley kerosene vaporizer, which has been under development for some time in this country and of which a large number have been shipped abroad, is now ready for the American market. It has been recognized for some time that we have either to come to two fuels—kerosene and gasoline—or else take a straight-cut product more like present-day kerosene than gasoline. Although the development of successful kerosene vaporizers does not necessarily mean that we will have both kerosene and gasoline, its significance lies in the ability to successfully use lower grades of fuel.

The new Holley vaporizer, known as Model 212, is especially adapted to Ford Model T cars. It is designed to start on gasoline and after 1 or 2 min. running to operate on kerosene. In the Holley instrument an extremely rich mixture of kerosene and air is pre-heated by the heat of the exhaust gases and subsequently made leaner by the addition of auxiliary cold air.

Referring to Fig. 1, which shows a section of the new instrument, kerosene and gasoline enter their respective float chambers through ordinary float valve mechanisms. From the float chambers, either fuel, depending upon the position of the two-way valve V, passes through the adjusting needle valve N, and through a jet at J, at the top of which it is atomized by an air blast induced by the suction of the motor, the air entering at A1. This is really an aspirating tube, but it has such a small area that the quantity of air admitted is only a small fraction of that required for combustion. This produces an exceedingly rich mixture.

This rich mixture of atomized fuel with the primary air is carried upward through a vaporizing tube T, seated in the exhaust manifold. This tube is coiled so as to absorb the maximum amount of heat from the exhaust, the temperature of the fuel reaching 500 deg. Fahr.

From this coil the rich mixture is led directly to the mixing chamber through the stuffing box B, where additional air is taken in through the air valve A2 to provide the proper mixture for combustion. The opening of the air valve in the mixing chamber is governed by the suction of the motor and by the opening of the throttle valve. From the mixing chamber the mixture in correct proportions is drawn into the engine cylinders through the inlet manifold in the usual way.

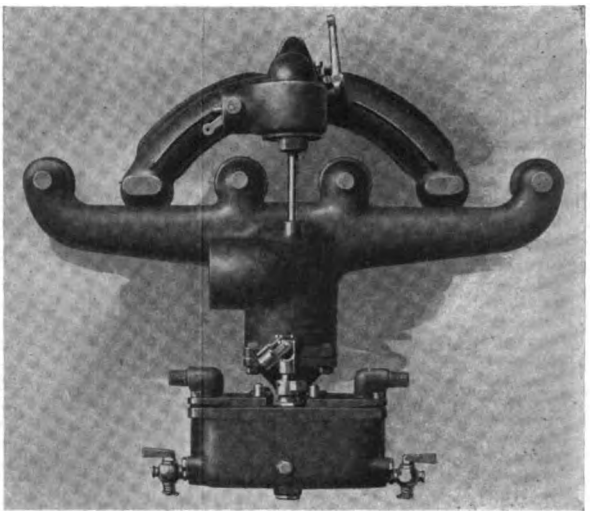


Fig. 2—The Holley kerosene vaporizer as seen from the outside. Gasoline is used for starting

In order to successfully handle the kerosene it is necessary to use a slightly lower compression than that employed in the standard Ford engine. This reduction in compression is accomplished by substituting a low compression head on the cylinders which brings the compression from about 60 per sq. in. gauge down to about 48 per sq. in. gauge. It is possible with the kerosene outfit to secure a maximum speed of about 40 m.p.h., and on the testing dynamometer the maximum horsepower is about 20 per cent less than with gasoline. As regards performance, however, this difference is not noticeable commercially. A test witnessed by a representative of THE COMMERCIAL VEHICLE showed a Ford car operating successfully at 6 m.p.h. with excellent acceleration upon opening the throttle from this speed on high gear. The outside appearance of the device is shown in Fig. 2.

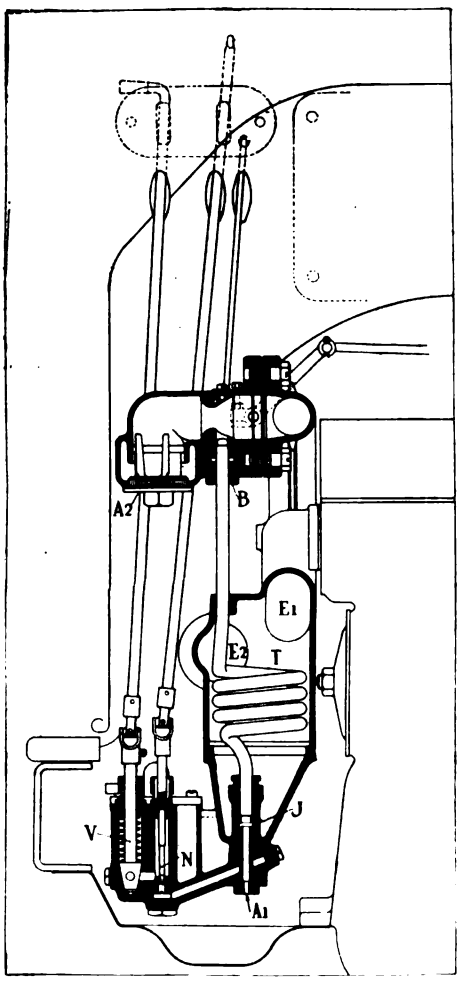


Fig. 1—Cross sectional view of the Holley device, showing its component parts. The exhaust gas enters at E1 and leaves at E2

Astra Oxy-Illuminating Gas Apparatus

DESIGNED to simplify lead burning in storage battery service stations, the oxy-illuminating gas apparatus made by Ashton, Laird & Co., New York City, employs oxygen and artificial or natural illuminating gases drawn directly from the gas mains. The outfit is distributed by the Bradford-Ackerman Corp., New York City, and is so assembled that its different component parts may be added to existing welding or decarbonizing apparatus to provide lead burning facilities and likewise other Astra appliances may be fitted to broaden the scope of lead burning to include soldering, brazing, tempering, annealing, cylinder decarbonizing and acetylene welding.

The equipment is offered in two models, a stationary and a portable outfit. The stationary type may be securely fastened to the wall by means of a bracket on which are mounted a regulating device, a gage and a clamp for the oxygen tank. From the single equipment the system may be piped to torches at different locations where work may be done simultaneously if desired.

The portable type can be moved to gas outlets convenient to the place where the work is to be done. A working radius of 16 ft. is provided and a greater stretch may be obtained by means of additional hose. Both types of implements are provided with a new design of pressure-reducing valve having a one piece non-corrosive metallic pressure seat and adjustable counter springs and no soldered parts.

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The oxygen regulator and the oxygen back pressure release valve for the illuminating gas line are operated automatically and are provided with an alarm whistle to attract instant attention. The regulator is also fitted with an attachable and interchangeable tank connection which can be made to fit any tank regardless of thread variation. A scrubber to prevent foreign substances from entering the working parts of the regulator is provided and may be removed easily for cleaning.

Five interchangeable burning nozzles of different sized orifices are furnished to provide proper burning flames according to the work to be done. The attachment is shown in Fig. 4.

Bound Brook Oil-less Type Bearings for Trucks

BOUND BROOK oil-less bearings are offered by the Bound Brook Oil-less Bearing Co., Bound Brook, N. J., in two main classes, bronze with recesses in which is placed a compound of the finest graphite, and wood bearings impregnated with graphite. The principle on which both of these types are made is that the graphite acts as a lubricant and makes unnecessary the use of oil to permit the revolution of the shaft within its bearing without binding.

Oil-less bearings in truck work are used particularly in spring shackles, clutch shafts and water pumps. The Autocar company uses the Bound Brook bronze type bearings at three different points on the cooling water pumps; the Kelly-Springfield Motor Truck Co., the same type on the clutch shafts of its trucks, and the International Motor Co., both the bronze and impregnated wood types on the spring shackles of its Mack trucks. Other concerns are using both types in electric self-starting and lighting units and others in motor and generator sets.

In construction, both types are very simple. The bronze type of bushings or bearings are merely grooved on the inside or out, or both, according to the work to be done, or even on the flanged ends, when the bearing is used for thrust purposes. These grooves do not extend clear around the circumference in all cases. Some are radially inclined, others angular and still others of the criss-cross type, some ending along a longitudinal line and starting slightly offset on the other side of the dividing rib.

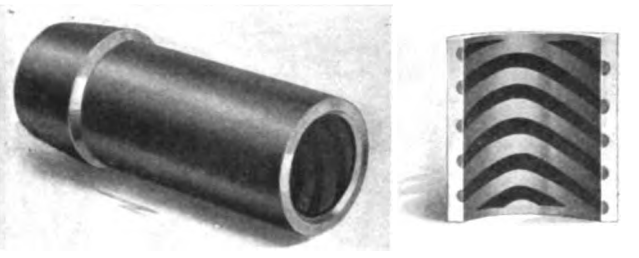


Fig. 5—Two Bound Brook bronze oil-less bearings. That at the left is a clutch shaft type; at the right, one manner of cutting the graphite-filled grooves

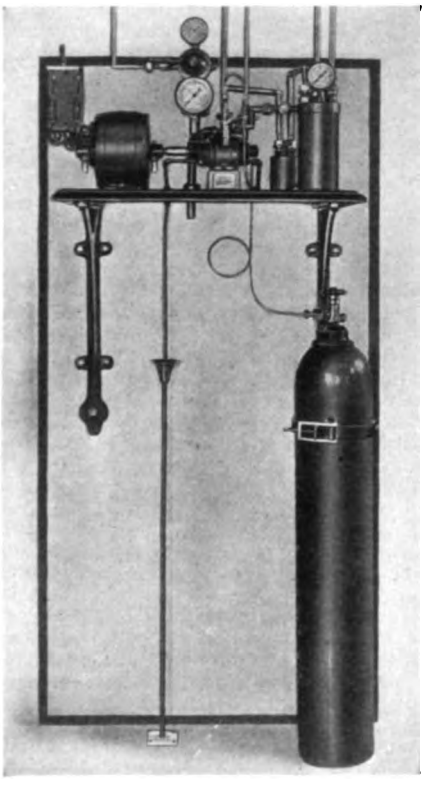


Fig. 4—The Astra stationary oxy-illuminating gas apparatus. It is also made in a portable model

The graphite and bronze surfaces are flush, wear evenly and require no refilling. The bearings on type will run with or without oil, but the use of oil will not injure them.

The wood bearings are used where dust and dirt are liable to accumulate on the ordinary bearing and follow the oil around, meantime scoring the soft bearing metal. With a wood type, these particles of dirt or metal are imbedded in the bearing itself, thereby keeping the shaft unscored. Two of the bronze types are shown in Fig. 5.

Indestructible Attachment for Fords

USING pressed steel wheels 34 in. in diameter, the Indestructible Ford adapter, made by the Indestructible Truck Sales Co., Indianapolis, Ind., is designed to provide a vehicle of 1-ton capacity. It is a chain-driven unit in which the Ford rear axle is used as a jackshaft. It consists of an extension frame carrying the rear dead axle and a special set of semi-elliptic springs in addition to the regular Ford rear spring which is used as an auxiliary member.

The frame of the attachment is a channel section and extends forward on either side of the Ford frame to a point almost even with the Ford radiator. It is wider than the Ford frame and is unswept at the front where it is joined to the frame.

In order to provide greater power at speeds of 10 to 18 miles per hour, the final gear ratio on the adapted vehicle is made 8 to 1, more than doubling that of the usual Ford vehicle. The frame is 14 ft. long, 32 in. wide and 4 in. deep and has its corners reinforced with gusset plates. The rear wheels are carried on Timken or Bower roller bearings and supported on a solid one piece axle 2½ in. in diameter. The regular Ford foot brakes are retained and hand brakes provided on the rear wheels with drums 12 in. in diameter and 3 in. wide. The rear tires are solids, 34 in. by 3½. The wheelbase of the converted vehicle is 120 in. with a standard tread of 56 in. This provides for from 9 to 10 ft. of loading space back of the driver's seat. A view of the adapted vehicle in chassis form and with a body are shown in Fig 3.

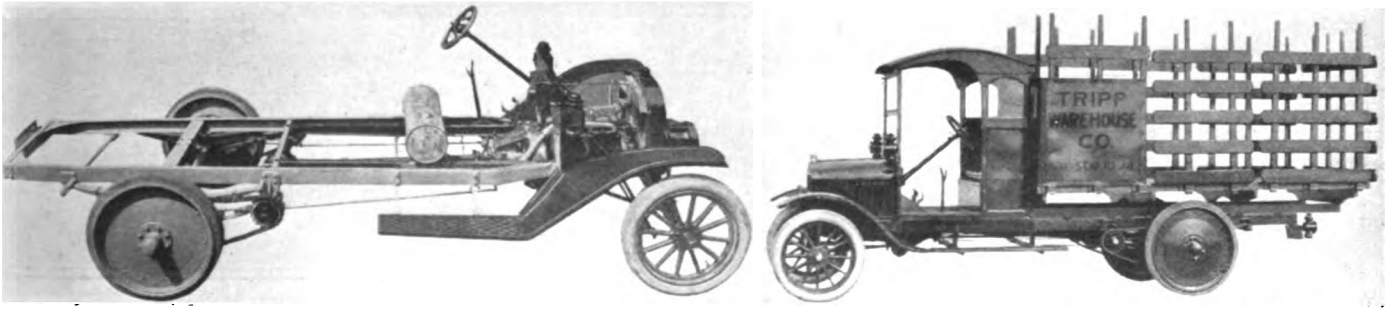


Fig. 3—The Indestructible Ford adapter, which is characterized by the use of 34-in. pressed steel wheels in the rear. It utilizes the Ford axle as a jackshaft for a chain-drive final drive

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Men and Makers

LOCOMOBILE Co. of America, Bridgeport, Conn., has had an increase of 34 per cent in its deliveries this year over the same period during 1916.

Republic Motor Truck Co., Alma, Mich., is now turning out trucks at the rate of one truck every 7 minutes, or eighty-six per day.

Four Wheel Drive Auto Co., Clintonville, Wis., will build a factory addition at once to meet the added demands of Government orders. The factory will be a duplicate of the one completed recently. It will be a one-story, sawtoothed roof structure, 100 by 180 ft. The plant, which makes F W D trucks, has increased in size over 300 per cent in the last 18 months.

Maxwell Motor Co., Detroit, is at present shipping trucks at the rate of about ten a day. This production will be speeded up as soon as additional equipment can be secured.

Reo Motor Car Co., Detroit, Mich., recently opened a $100,000 clubhouse for the use of its employees and their families. There are 5200 members and no fees or dues. Three meals are served daily at exact cost. A slight charge is made for billiards, pool and bowling privileges. On the main floor is an auditorium with seating capacity of 1700, a motion picture projector and pipe organ.

Niles Car & Mfg. Co., Niles, Ohio, adopted a new sales policy this month. The former practice of selling direct from the factory to the consumer has been discontinued, and orders will be taken through agents only.

Willys-Overland Co., Toledo, Ohio, has driven 4103 motor vehicles from its plant so far this year. The number driven away in January was 903, in February 1058 and in March 2142. The company is served by 12.3 miles of railroad tracks. This is one of the largest private railroad terminals in the country. The company uses 5,000,000 pounds of transmission grease and 3,000,000 pounds of cup grease yearly.

Studebaker Corp., South Bend, Ind., has taken out a permit for the erection of a building for machining work. The structure will cost $200,000, and will be of steel, brick and concrete construction. The company recently had a patriotic mass-meeting at Plant No. 1, Detroit. The 2000 employees of the factory contributed at this time to the Red Cross fund. The affair was arranged by the young women of the top factory, and without any suggestion or knowledge on the part of the executives. The American flag displayed at this time was made by one of the employees in the top department.

Acason Motor Truck Co. has moved into its new factory in Detroit. The building is a one-story brick construction with Fenestra steel sash. The company will produce 75 trucks monthly for the balance of the year.

Guaranty Truck Co., Boston, Mass., a new corporation, has put its first demonstrator into commission and the work of assembling others is now under way.

Graham Bros., Evansville, Ind., maker of the Graham Bros. 1-ton truck unit, have received nearly all the raw materials for which they have been waiting, and are ready to make prompt deliveries.

Tower Motor Truck Co., Greenville, Mich., has started operations in its new plant and expects to turn out 100 trucks this year. The building is 60 by 220.

Hahn Motor Truck & Wagon Co. will build the first unit of its factory building shortly. It will be known as the chassis assembling building, 52 by 192.

Lumb Motor Truck & Tractor Co., Aurora, Ill., turned out the first completed truck this week. The first model has a 2-ton capacity and 5400 lb. It is equipped with a 37-hp. four-cylinder Buda engine.

Curtis Form-A-Tractor Co., Chicago, will remove its plant to Batavia, Ill. One hundred men will be employed at the outset. The Benson Engineering Works will be utilized for the plant.

Russell Motor Car Co, Toronto, Ont., has placed three farm tractors at the disposal of the War Resources Commission for use in the Province of Ontario.

Maxwell Motor Corp.'s Boston branch has been moved from 440 Newbury Street to a new building at the corner of Massachusetts Avenue and Newbury Street. Hoover Holton is in charge there.

White Co., Ltd., has located in Winnipeg, Man., and will occupy a building to be completed by June 15. Construction is already under way.

Estera-Ruiz & Co., 10 Broadway, New York, has contracted the agency for KisselKar trucks in Mexico. A special carload of KisselKar trucks was shipped this week for the Mexican border, where they will be reloaded for forwarding to Mexico City.

Mackbuilt Motor Co., formed in Boston to handle that truck for New England, is to lease salesrooms on Commonwealth Avenue, formerly occupied by the McCarthy-Meyer Co., Abbott-Detroit agent. The company comprises Nicholas J. Wallis, president; J. B. MacMahon, Jr., vice-president; Proctor Fisher, treasurer. The company also handles the Redden truck maker.

M. F. Chase Co., Boston, Mass., has been reorganized into the Owen Magnetic Co., and it has taken on the Bourne Magnetic truck.

Eastern Motor Sales Co., Boston, Mass., has taken the agency for the Diamond T trucks. It also has the agency for the Maxfers truck maker.

Ransom-Britton Co., Cambridge, Mass., agents for the Bethlehem truck, has leased quarters in a new building just being finished on Commonwealth Avenue, Boston, and will move in a few weeks.

KisselKar agencies recently established are: Williams & Easley, Trinidad, Colo.; Atascadero Mercantile Co., Atascadero, Cal.; Charles W. Knickerbocker, Watsonville, Cal.; W. N. Murphy Sales Co., Pasadena, Cal.; Auto Inn, Kokomo, Ind.; Scott Motor Co., Oklahoma City, Okla.; D. & S. Motor Co., Des Moines, Iowa.

United States Wire Tire Co. will build its plant at Pittsburgh, Pa.

M. C. W. Motor Sales Corp., Metropolitan distributer for D-E trucks, made by the Day-Elder Motors Co., Newark, N. J., has also taken on the distributorship for the Stegeman trucks, a heavier line, which enables the company to offer a complete range of trucks from 1250 pounds to 5 tons. The M. C. W. company will have charge of the sale of the Stegeman trucks in the States of New York, New Jersey and Connecticut. It was formerly only Metropolitan distributer for the D-E line, not including the Brooklyn territory, but has now taken over all of Long Island and part of New Jersey. The M. C. W. company is formed of Willard S. Mears, formerly manager of the Sterling Motor Truck Co., of New



Some day another Stewart Edward White instead of writing about logging down the river will tell of the wonders in conquering nature wrought by aid of the motor truck. Firestone tires are used on the wheels of the truck and trailer bearing this load

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York; **Harry B. Carpenter**, formerly salesman with the Republic Tire & Rubber Co., and Sol. Wall, formerly salesman for the Sterling company in New York City. Mears is president, Wall vice-president and Carpenter secretary and treasurer.

Kuehn & Metz have become Metropolitan district agents for the Atterbury line of trucks, made by the Atterbury Motor Car Co., Buffalo, N. Y. They have a showroom, service station and offices at 318 West Forty-eighth Street.

Goodyear Cotton Mills, Goodyear, Conn., maker of the fabric for Goodyear tires, is doubling its plant. Among the new buildings is a storehouse with a capacity of 10,000 bales. The completed plant will have a capacity of more than 150,000 pounds of tire fabric weekly.

B. F. Goodrich Rubber Co., Akron, Ohio, is turning out approximately 30,000 tires daily. The company is working on a 24-hour schedule, closing from midnight Saturday to midnight Sunday.

Doughty Tire Co., Boston, Mass., has been organized by Henry M. Whitney, a prominent business man, and a factory has been started at Providence, R. I. The tire involves a new principle in structure.

Denver Tire Service Co., Denver, Colo., distributer of United States tires, has moved into new quarters at 1830 Broadway. The rooms can accommodate twenty cars for tire changes at one time.

United States Rubber Co.'s Omaha branch is to have a reinforced concrete and brick five-story building ready for occupancy Nov. 1.

Clum Mfg. Co., Milwaukee, Wis., maker of truck switches, has moved into a new factory at 23-25 Erie Street, which will afford about four times the floor space of the old plant.

Dail Steel Products Co., Lansing, Mich., is erecting a new factory addition and office building in which it will manufacture accessories.

Lavine Gear Co., Racine, Wis., has completed the foundations to its new factory. When the additions have been erected they will triple the capacity of the present plant.

Russel Motor Axle Co., North Detroit, manufacturer of an internal gear drive unit for motor trucks, has instituted a bonus system which will start its first payments August 1. The increase is 10 per cent of the workers' monthly earnings and is paid in lumps of three months at a time. The August payment will cover the earnings of the preceding February, March and April; the November payment will cover the May, June and July period. The department foremen have the right to veto a worker's bonus for cause. The company's employees have recently purchased five flags to hang in the factory.

Covert Gear Co., Lockport, N. Y., has taken over the former plant of the Gray Motor Co., Detroit. The Gray plant, which has a floor space of 56,000 sq. ft., will be used to manufacture about twice as many transmissions as are now made in the Lockport factory.

Champion Ignition Co., Flint, Mich., has established a daily production schedule of 80,000 A-C spark plugs, and has placed an order for automatic screw machinery amounting to $50.000.

S. F. Bowser & Co., Fort Wayne, Ind., has given its employees a wage increase of 25 to 30 per cent. About 900 employees profit by the advance.

Fuller & Sons Mfg. Co., Kalamazoo, Mich., maker of transmissions, has let a contract for a new heating plant. The new four-story factory building is progressing and is now up to the third floor.



"Vive la France!" shouted these youngsters from the French orphanage when they saw General Joffre and others of the French mission in the big Fifth Avenue parade on April 19. It was a great day for Franco-American co-operation. Notice that the little girls loyal to the tri-color are being conveyed in a truck made in the United States, an Autocar

Bound Brook Oil-less Bearing Co., Bound Brook, N. J., has awarded a contract for a foundry at plant No. 2, Lincoln, N. J. The new building will be 60 by 100 ft., two stories high, and of steel and brick construction.

J. C. Gorey & Co., New York, has taken the Eastern agency of the Warner Gear Co., and will carry stock after June 1, including standard transmissions, control sets, clutches and steering wheels, for immediate delivery.

Philadelphia Storage Battery Co., Philadelphia, Pa., has completed a new factory which will double its capacity.

Crucible Steel Co. has enlarged its plant at Norwalk, Ohio, and will employ about 300 more men there.

Connecticut Auto Mfg. Co., Bridgeport, Conn., will build a four-story factory 70 by 128.

R. E. Olds, president of the Reo Motor Car Co., has been elected a life member of the Burgesses Corps. The corps is the oldest military organization in this country, and has honored many famous men, including rulers of other lands. It was originated in 1691 for the defense of the colonists at Albany, N. Y., and its armory is located in that city.

John N. Willys, president of the Willys-Overland Co., Toledo, Ohio, has returned $1,075,300 personal property for taxation. This is the largest personal tax return in Lucas County, Ohio.

F. W. Hughes has been appointed production manager of the Indiana Motor Truck Co., Marion, Ind. He was formerly resident engineer in Detroit for the Covert Gear Co.

C. McElfresh has assumed charge of the motor department of the Republic Motor Truck Co., Alma, Mich. He was formerly production manager at the Muskegon, Mich., plant of the Continental Motors Corp.

K. R. Jacob has been appointed assistant sales manager of the Willys-Overland Co.

H. G. Fides has been appointed director of service of the Willys-Overland Co.

Walter E. Parker, president of the Commerce Motor Car Co., has returned from a trip to the Far East.

J. G. Murphy has resigned from the staff of the Pierce-Arrow Motor Car Co., Buffalo, N. Y., to become superintendent of the Pathfinder Co., Indianapolis, Ind.

Max Olsen, Seattle, Wash., has not become sales manager for the Roesch Motor Car Co. in the same territory, as reported in the May 1, 1917, issue of THE COMMERCIAL VEHICLE, but has been appointed district sales manager on the Pacific coast for the Atterbury Motor Car Co., Buffalo, N. Y. He assumed his new duties about April 1, and makes his headquarters at San Francisco.

J. P. Burris has been placed in charge of the national sales business of the Diamond T Motor Car Co., Chicago. He resigned recently from the staff of the Packard company.

R. E. Breeden has been appointed special territory man in charge of appointing distributers for the Diamond T Motor Car Co., Chicago.

F. J. Pardee has been appointed head of the sales department of the Diamond T Motor Truck Co., Chicago.

W. T. Brush has resigned as assistant sales manager of the Studebaker Corp., and has purchased a half interest in the Philadelphia Sales Corp., distributers of Studebaker products in Philadelphia, Pa.

G. A. Holder has left his position as special auditor for the Maxwell Motor Car Co. to be general auditor of the Harroun Motors Corp.

G. H. Barmore, **A. J. Sears** and **W. A. Ziegler** have been promoted in the Goodyear organization. Mr. Barmore has become assistant manager of the Chicago branch, having been formerly manager of the Milwaukee, Wis., office. Mr. Sears goes to Milwaukee from the managership of the Sioux City, Iowa, branch. W. A. Ziegler has been made manager at Sioux City. He was formerly city salesman in Milwaukee.

C. M. McCreery has been appointed special manufacturers' representative in Chicago for the Goodyear Tire & Rubber

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Co., Akron, Ohio. He was formerly assistant manager of that district.

Maurice Cryder and **H. A. Smith** have been awarded fellowships in rubber chemistry at Akron University, Akron, Ohio. Cryder was appointed by Goodyear and Smith by Firestone.

Putnam Drew, formerly advertising manager for the R. E. Taylor Corp., distributer of Garford trucks in the East, later holding a similar position with the Gramm-Bernstein Sales Co. until the latter went into bankruptcy, is now at liberty seeking a new connection. During his connection with the R. E. Taylor Corp. he was editor of its house organ, "Taylor's Live Wire." He has had more than 25 years' experience in newspaper and editorial writing.

W. S. Boone has been made special manufacturers' representative in New York for the Goodyear Tire & Rubber Co., Akron, Ohio. He was formerly supervisor of city sales in Philadelphia, Pa.

C. A. Oldham has been made district manager of the United States Tire Co., St. Louis, Mo. He was formerly resident manager of the company at Kansas City, Mo.

Joseph Ward has been made district manager of the United States Tire Co. for the Terre Haute, Fort Wayne and Indianapolis, Ind., branch. He was formerly local branch manager at Indianapolis.

R. J. Murphy has resigned from his position as Southern manager of the B. F. Goodrich Rubber Co. to enter the motor vehicle business as a wholesale distributer.

J. R. Cheshire has been appointed Southern manager of the B. F. Goodrich Rubber Co., with headquarters at Atlanta, Ga.

V. W. Kliesrath, who has been chief engineer of the Bosch Magneto Co., Springfield, Mass., for a great many years, has handed in his resignation, to take effect in the near future. Mr. Kliesrath has been directly in control of the main office and also of the engineering and technical department. He has no immediate plans for the future further than a short vacation.

Mathew Farrell, New York sales engineer for the Duplex engine governor, has been ordered to Fort Sam Houston, San Antonio, Texas, as captain of the Quartermaster's Department, Officers' Reserve Corps, in the army transport and similar motor truck service.

Lowell C. Freeman has been appointed chief engineer of the Fuller & Sons Mfg. Co., Kalamazoo, Mich., transmission maker. Mr. Freeman was formerly chief engineer of the Denby Motor Truck Co.

R. F. Anderson, formerly of the body engineering department of the Packard Motor Car Co., has become body engineer of the Hayes-Ionia Co., Ionia, Mich.

J. F. Keyes has been appointed engineer for the Standard Parts Co. He was formerly experimental engineer of the Cadillac Motor Car Co.

H. Russell Brand has been appointed business engineer of the Springfield Body Corp., Springfield, Mass., and Detroit.

J. H. McConnell has taken charge of the sales department of the Shotwell Pump & Tank Co., Indianapolis, Ind.

John Whyte has been appointed chief engineer of the Bailey Non-Stall Differential Corp. He was formerly engineer of the battery service of the Prest-O-Lite Co., Indianapolis, Ind.



How would you like to be in a class with the late James J. Hill, Commodore Vanderbilt, Jay Gould, and E. H. Harriman? Answer: Buy a motor truck. Time was when high finance and Government aid were needed to create transportation systems; but here is a truck on its way from New York to Chicago without creating any agitation at Washington or Wall Street. It's a Master 2-tonner, and there are five more being made every day.

J. R. Brooking, Eugene R. Johnston and **J. B. Schroeder** have been appointed district managers for the Bailey Non-Stall Differential Corp. Mr. Brooking, in charge of Chicago, Minneapolis, Minn., and St. Louis, Mo., was formerly with Studebaker in the Northwest. Mr. Johnston, in charge of the Kansas City territory, was formerly with Maxwell in New England. Mr. Schroeder, in charge of Michigan, Ohio and Indiana, was formerly with the Miller and Thermoid rubber companies.

J. A. White has been made sales manager of the battery division of the United States Lighting & Heating Corp. He was formerly manager of the company's Chicago branch.

C. L. Lane has been named vice-president and general manager of the United States Lighting & Heating Corp., Niagara Falls, N. Y. He was formerly secretary of the company.

W. G. Gernandt, formerly of W. G. Gernandt & Co., consulting engineers, Detroit, has opened an office in Chicago for automotive engineering consultation.

Martin Murray has been made sales manager of the Corcoran Mfg. Co.

C. F. Clark, who has been for several years manager of the Michigan Electric Welding Co. and a director of the Steel Products Co., has resigned to become a member of the Officers' Reserve Corps.

G. M. Bicknell has been appointed sales engineer of the Carter Carburetor Co., St. Louis, Mo., with entire charge of the factory sales in and around Detroit, and of all the company's engineering work in the field.

L. W. Swords has left his position as factory representative for the Maxwell Motor Co. to become sales supervisor and vice-president of the Wallace C. Hood Service Bureau.

J. B. Clarkson, one of the leading importers of motor vehicles and accessories in Wellington, New Zealand, has come to New York on a business trip.

W. D. Bell has been appointed superintendent of employment for the Parker Rust-Proof Co. of America.

C. L. Miller has been appointed secretary of the Detroit Executive Club. He was formerly assistant production manager at the Detroit plant of the Continental Motors Corp.

A. C. Bagby has become manager of the recently formed credit department of the Motor and Accessory Manufacturers. Mr. Bagby is credit manager of the Hess-Bright Mfg. Co., Philadelphia, Pa.

Theodore D. Pratt, formerly president of the Motor Truck Club of America, New York City, and works engineer for the Central Stamping Co., Newark, N. J., where he had charge of that concern's fleet of motor trucks, has been appointed executive secretary of the Motor Truck Club. During the interim of his connection with the Central Stamping Co. and the Motor Truck Club he was one of the members of the E. D. Nelson Mfg. Co., Farmingdale, L. I. He will now devote his entire time and energies to the advancement of the Motor Truck Club and the interest of its members.

"The Kant Slip Motor Goose" is a group of nursery rhymes by Maurice Switzer, illustrated by August William Hutaf, published for people of all ages. The verses and drawings are clever and in each case they point the special moral —buy Kelly-Springfield tires.

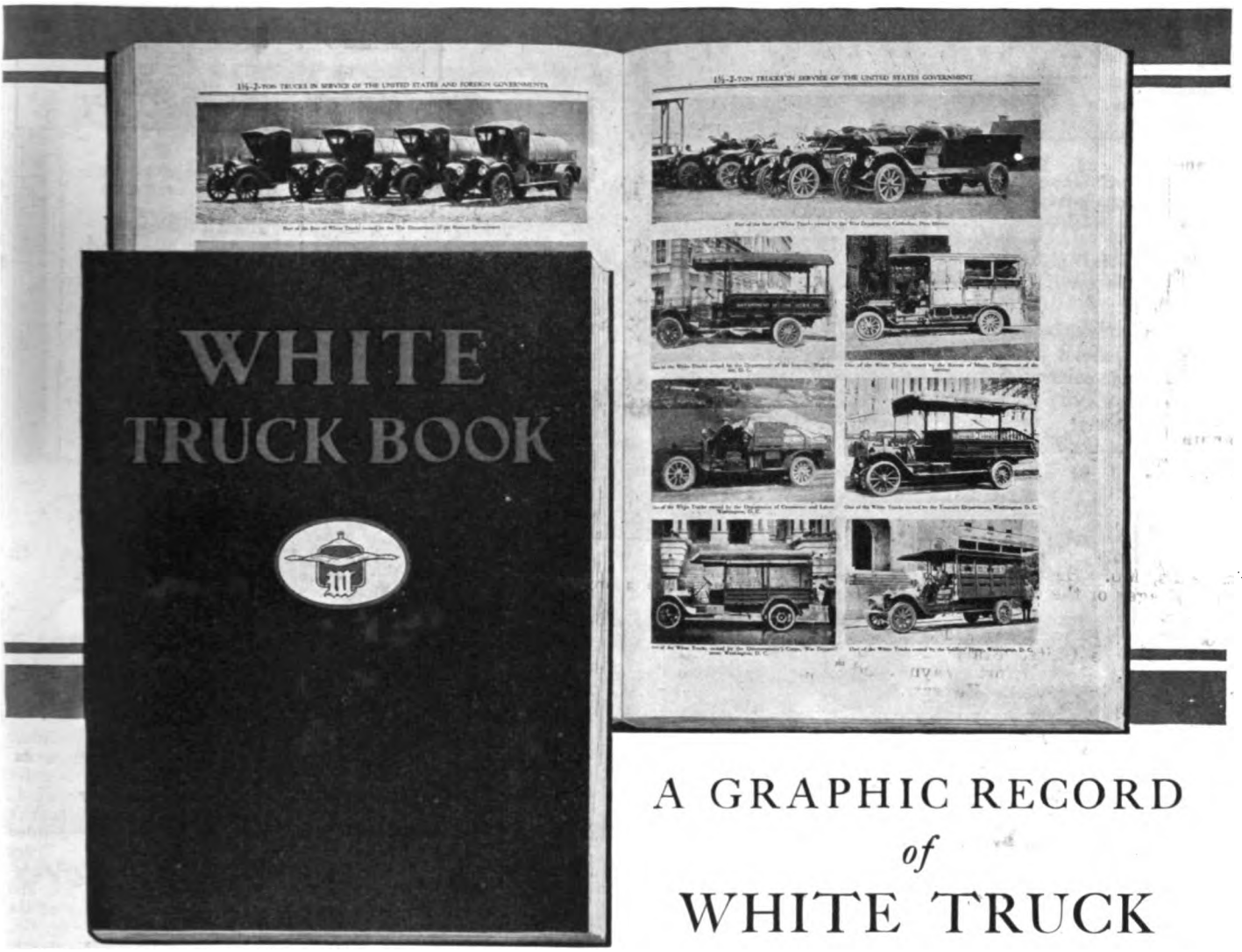
Samples of Tin for Factory Roofing and other purposes are being issued in the form of a notebook by Merchant & Evans Co. Between each small sheet of tin there is a cardboard sheet of the same size describing the product.

Mexico Offers a Big Truck Market, according to Emanuel de Campo, Kissel-Kar dealer in Mexico City. The unorganized condition and poor equipment of the railroads make the motor truck especially needed.

Australia Needs Truck Demonstrators, according to a report from the United States commercial attache at Melbourne, P. B. Kennedy. Mr. Kennedy says that there is a market for motor-driven commercial vehicles in Australia, but the public there is not yet convinced of the usefulness of trucks. A few good salesmen and demonstrators might do much to improve the situation, is his belief.

India Wants Trucks, according to a report from the Bureau of Foreign and Domestic Commerce, Washington, D. C., which states that an Indian importing firm is in the market for commercial vehicles. The bureau will furnish details.

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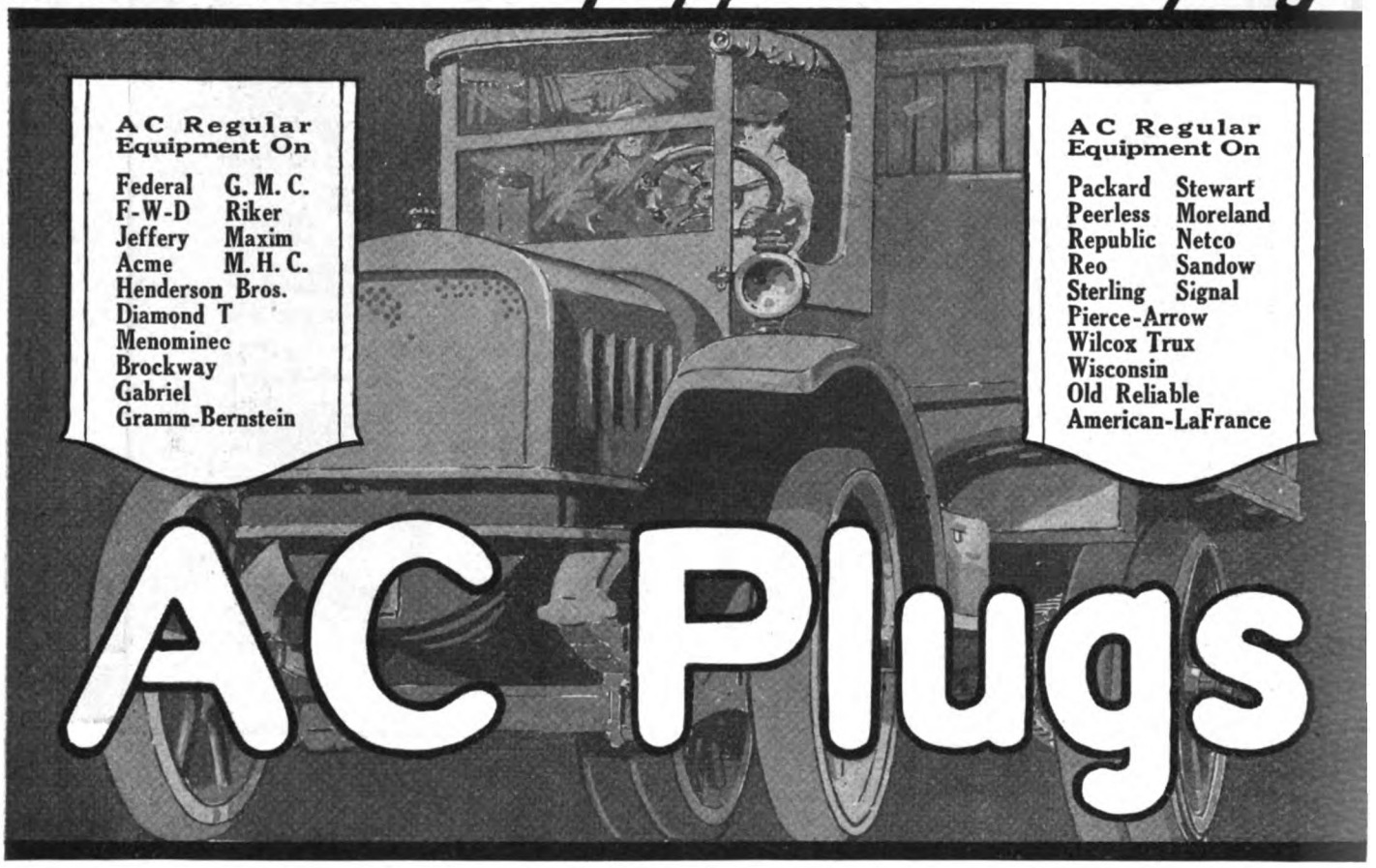
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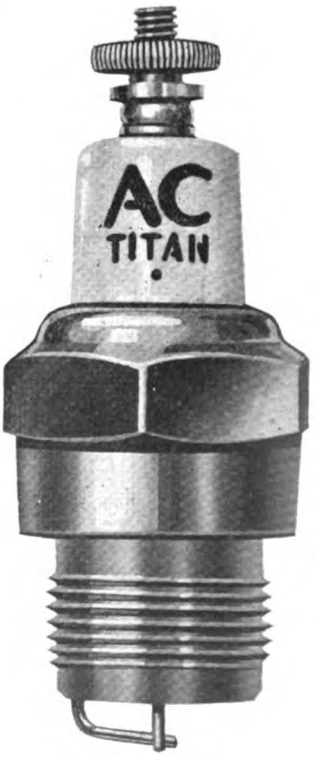
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The Home of the HALL

THE PICTURE SHOWS THE FACTORY WHERE these attributes are built into the Hall. Here are forged and machined the sturdy chassis frames, which are linked with the supremacy of the Continental Motor, Timken Axles and Bearings, and other standard units.

IRON WORKERS OF LONG EXPERIENCE, men who know just what it means to make weight-carrying, strain-resisting, non-vibrating frames of the finest metal, are at work here making the chassis members.

THE SPEEDIEST AND MOST EFFICIENT DUMPING DEVICE (Wood Hydraulic Hoist) known to truckdom is fitted on every Hall Truck, helping to give it the time-saving qualities for which it is famous.

The HALL TRUCK is noted

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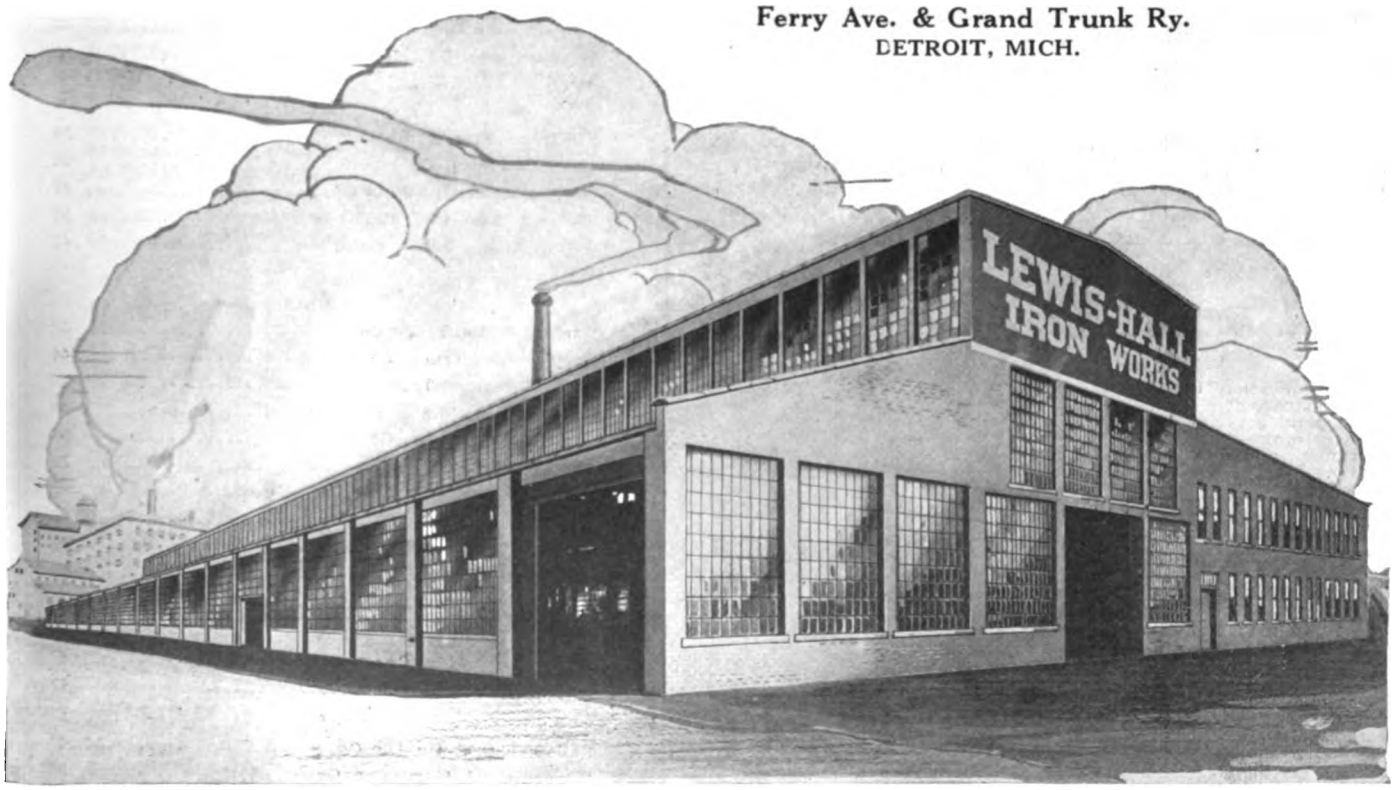
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DEALERS who handle the Hall not only receive every other sort of sales help, quick deliveries and generous terms, but we assist them in financing partial payment sales. Write for complete Dealers' Proposition.

Five Models: 2-ton, chain $2,000; 3½-ton, chain or worm, $2,800; 5-ton, chain or worm, $3,600.

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"Patent Pending"

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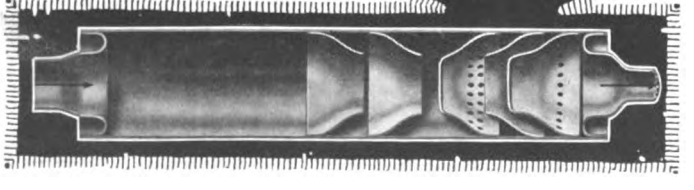
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and various other forgings for the automobile and truck manufacture.

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Plant: West Allis — MILWAUKEE, WISCONSIN

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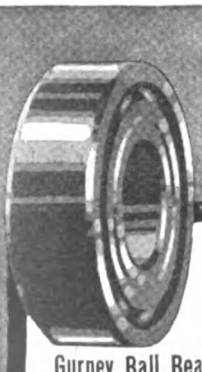
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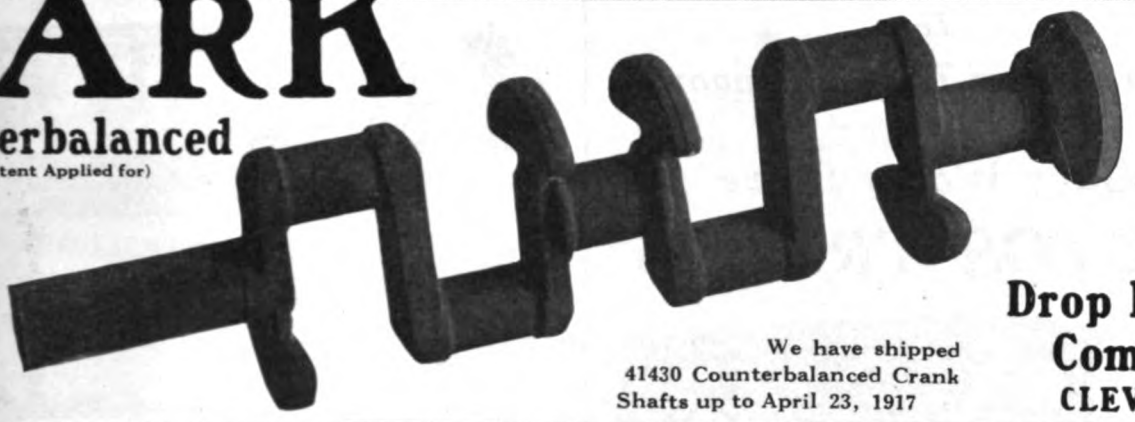
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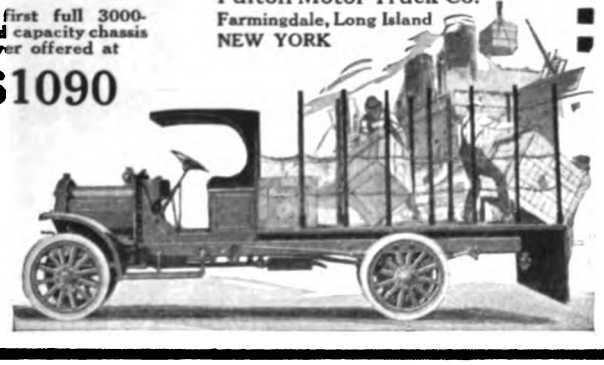
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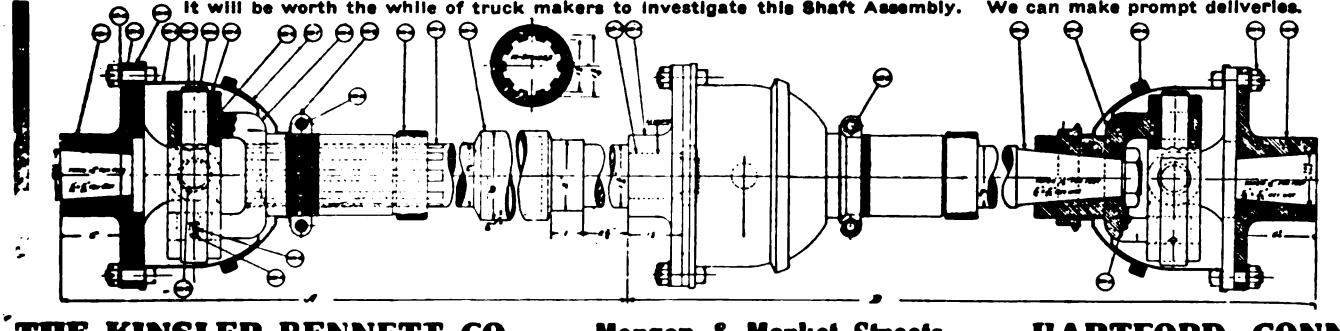
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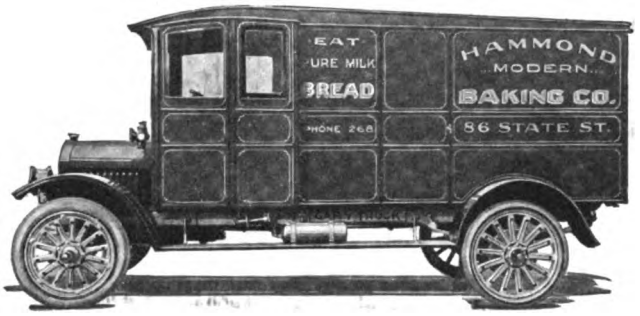
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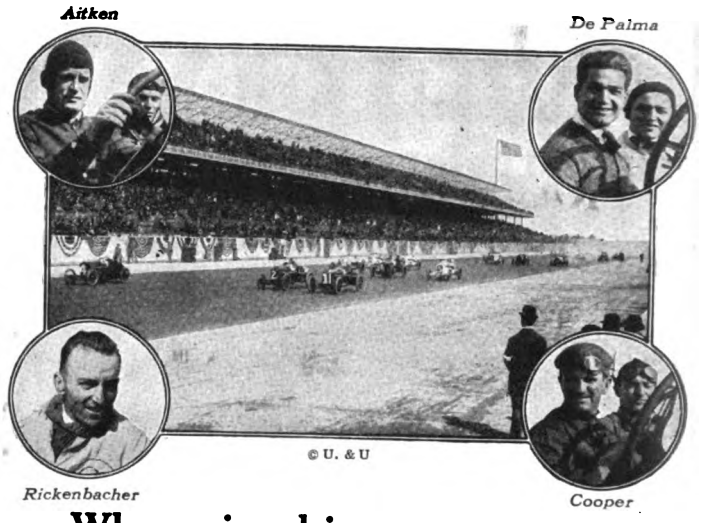
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Manufacturers of
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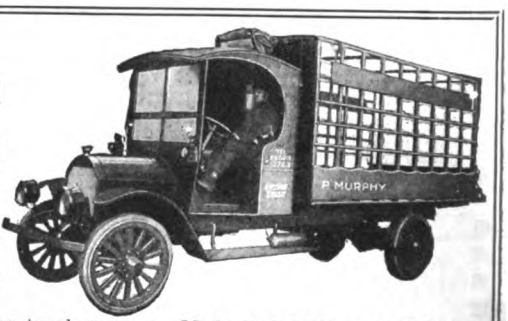
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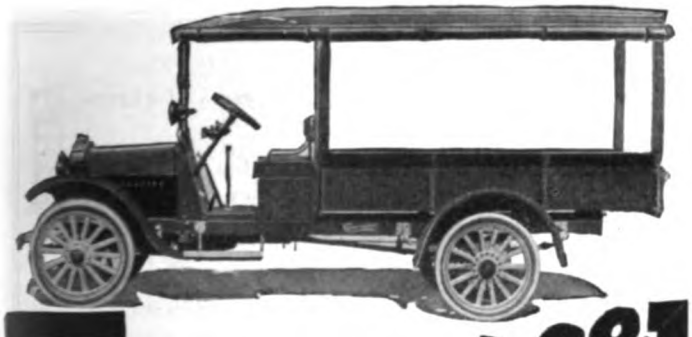
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1 TON CAP

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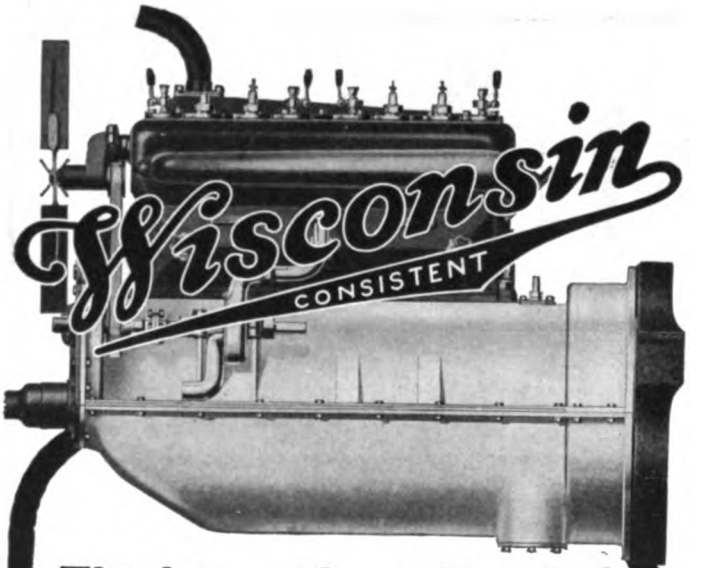
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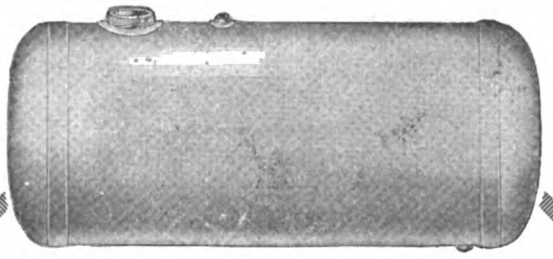
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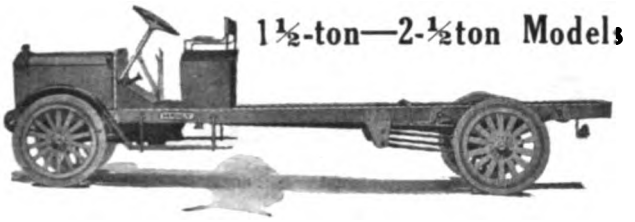


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NEW BRUNSWICK NEW JERSEY



1½-ton—2-½ton Models

America's New Quality Truck Has 20 Remarkable Features—

features proven in the fire-test of actual service to be of money-saving merit to users and sales creative value to dealers. These set MANLY Trucks in a class far up among quality commercial vehicles.

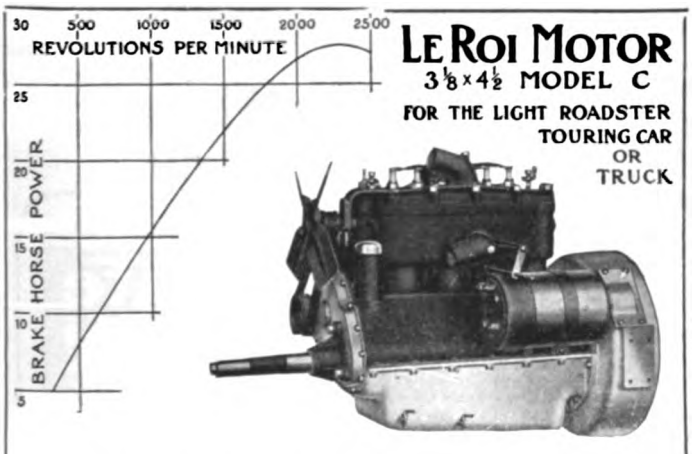
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The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

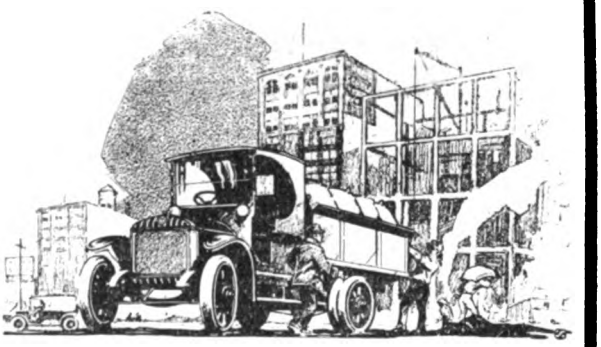
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Under the severest tests, with the hardest usage, even abuse, Diamond T Trucks have demonstrated beyond question their high quality construction, their absolute dependability and matchless fuel economy.

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5 MODELS
All Worm Driven

1 Ton, 1½ Ton, 2 Ton,
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Supremacy

as a descriptive word falls short of its true meaning when applied to a product that has no rightful claim to such distinction.

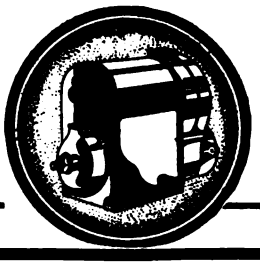
For supremacy can mean one thing and one thing only. Either a product is or is not supreme, in its class. If it is not, mere assumption will not make it so.

Only through general acceptance as the standard dumping equipment of the motor truck industry, based upon all around superior performance in the service of users, have Wood Hoists and Wood Bodies been able to attain and maintain their position of undeniable supremacy

Wood Hydraulic Hoist and Body Co.

Sole Manufacturers

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Who Got the Jump in Magneto Making?

The first strictly high-tension magneto was an Eisemann. It was designed and built sixteen years ago.

The lead which the EISEMANN assumed then never has been relinquished.

Judge how firmly this magneto has held its leadership by the quality of the motor trucks whose makers use the EISEMANN as standard equipment. The list of 69 includes Federal, G. M. C., Gramm-Bernstein, Kelly, Pierce-Arrow, Service, Sterling and White.

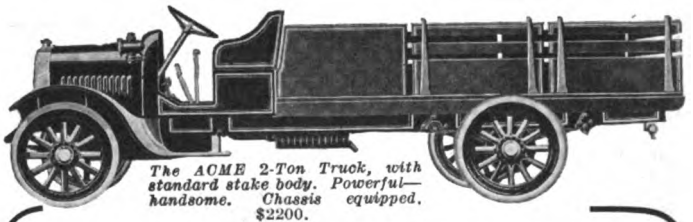
Truck service, better than anything else, reveals the difference between magnetos. Eisemann superiority is positive and clearly demonstrable.

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EISEMANN MAGNETO



The ACME 2-Ton Truck, with standard stake body. Powerful—handsome. Chassis equipped, $2200.

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DEALERS: Get the quick, profitable business of local truck buyers who know the advantages of ACME Trucks and want them for early delivery. The surest selling features to meet customers' requirements for from 1-ton to 3½-ton capacities.

Clinch the ACME Agency now—and sell easily, with substantial profit. No large service to render because of fifteen famous "Proved Units" from radiator to tail light. ACMES have oversize dimensions. The 2-ton ACME has powerful 40 H. P. Continental Motor and big capacity—Chassis, equipped $2200. 3½-ton model sells at $3000.

ACME THE TRUCK OF PROVED UNITS

Be in a position to accept big business on our One-Ton Truck. Announcement and specifications sent on request. An all-feature worm drive ACME —$1575.

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Russel

Internal Gear Drive Axles



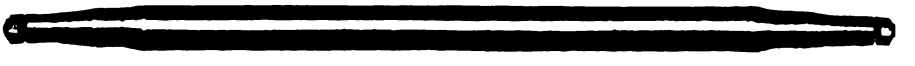
The Russel Internal Gear Drive Axle has retained and improved all the good features of the chain drive, and has eliminated all the bad ones.

The chain drive, when new, is the most efficient drive for moto trucks. But it soon loses its efficiency, as the chains yield, wear rapidly and become noisy.

Large manufacturing experience is back o Russel design and workmanship. We have supplied more manufacturers of 1 and 2 ton trucks with jackshafts than any other axle maker.

Russel Motor Axle Company
North Detroit

The Russel Load Carrying Axle is a one-piece round bar of chrome-nickel steel



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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI February 15, 1917 No. 2

Cleanliness Chief Asset of Trucks in Butter Delivery

Fleet of Twenty 1-Ton Electrics and Three Gas Trucks Distribute Dairy Product Within 15-Mile Radius of Gotham Plant

CLEANLINESS, cheapness and advertising value were the three most important advantages accruing to motor trucks and not to horse wagons which led the Blue Valley Butter Co. to purchase an entirely horseless delivery equipment when that concern opened its New York City branch for the distribution of dairy products, principally butter, to retail stores in the Metropolitan area.

Cleanliness is one of the prime requisites in the handling of dairy products of all kinds, and especially butter, which every one knows seems to have an indefatigable capacity for absorbing the odor from other goods carried in close proximity to it.

Drivers' Hands Must Be Clean

It is also taken for granted that a driver of an electric truck gets his hands covered with grease and oil less often than one who drives a gasoline commercial vehicle, due principally to the absence of the gasoline motor and carbureter and the general tendency for gasoline truck drivers to swab off their engines, adjust their carbureters, etc. This elimination of the drivers' dirty hands was also considered, for it must be remembered that the drivers of the Blue Valley fleet are really more salesmen than drivers. They get the orders and actually deliver the goods from the trucks to the counters in the retail stores. It would have availed the company nothing after clean manufacture of the product if clean delivery to the retailer's store, if it was made greasy and oily through the medium of the driver's soiled hands

Every housewife knows better than to place an uncovered crock of butter in the family ice box along with fish, onions and lemons, if she expects her butter on

its print butter, made from Pasteurized cream churned fresh every day, the Blue Valley company could not with consistency risk the final condition of its product as delivered to the store by the use of anything of vehicular

all of which is delivered. The vehicles are lined up for loading at the curb, and the goods transported from the store to the tailboards by

The present make-up of the Blue Valley fleet in New York City consists

PRACTICAL SERVICE

THE COMMERCIAL VEHICLE does not deal in platitudes or glittering generalities.

It is a sincere—rigidly edited magazine—an authority on motor transportation that contains the first and best news of that field.

Its service is practical—saving time and money for those who subscribe.

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239 West 39th Street New York

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Read by Business Men

Published on the first and 15th of every month
Entered as second-class matter, September 13, 1906, at the Post Office, New York, N. Y., under Act of Congress, March 3, 1879

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BALL BEARINGS
(PATENTED)

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"NORMA" Bearings are standard in the high-grade magnetos used on automobiles, aeroplanes and motor boats of the better class. The dependability of these magnetos recommends them pre-eminently for truck service. "NORMA" Bearings are a distinctive feature of dependable magnetos.

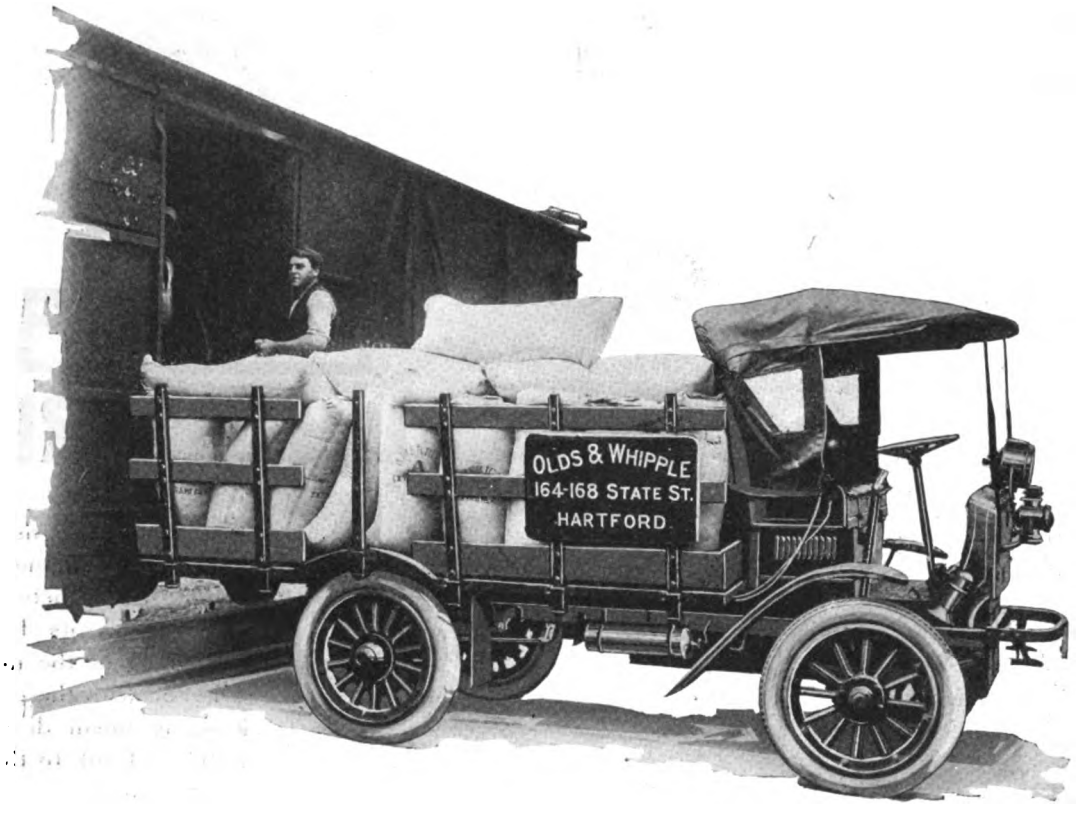
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Ball, Roller, Thrust and Combination Bearings

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Endorse Autocar After Six Years' Use

Olds & Whipple of 164 State Street, Hartford, Conn., say: "We have been using Autocars for the last six years and are well satisfied with results, as we are getting good mileage on tires, also gasoline consumption, and can recommend same as having plenty of power and speed for a truck."

Write for illustrated catalog and list of more than 4500 concerns using Autocars in every line of business

THE AUTOCAR COMPANY

ARDMORE, PA.

Established 1897 **MOTOR DELIVERY CAR SPECIALISTS**

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI June 15, 1917 No. 10

Stationery House Doubles Business in 3 Years by Use of Motors

Converts Concern Into Businessman's Department Store Through Quick and Reliable Delivery

THREE motor trucks owned by a stationery concern in Pittsburgh, Pa., have changed that company into a businessman's department store, and in less than 3 years doubled the amount of business done. Along with these results, they have also almost doubled the delivery radius and increased the delivery area four times, or from a radius of 5 miles when horses were used to 8 miles by motor trucks.

While these results seem remarkable, they are not at all unusual and are merely the result of making an efficient study of the relation between the delivery of goods and their sale.

The work was carried on and brought to a successful conclusion by C. P. Koehler, vice-president and general manager of the A. W. McCloy Co. of Pittsburgh, Pa., whose methods of truck operation were described in the April 1, 1917, issue of THE COMMERCIAL VEHICLE. He first conceived the idea that he could increase the business of the McCloy company by offering its customers a better service than they could obtain from its competitors.

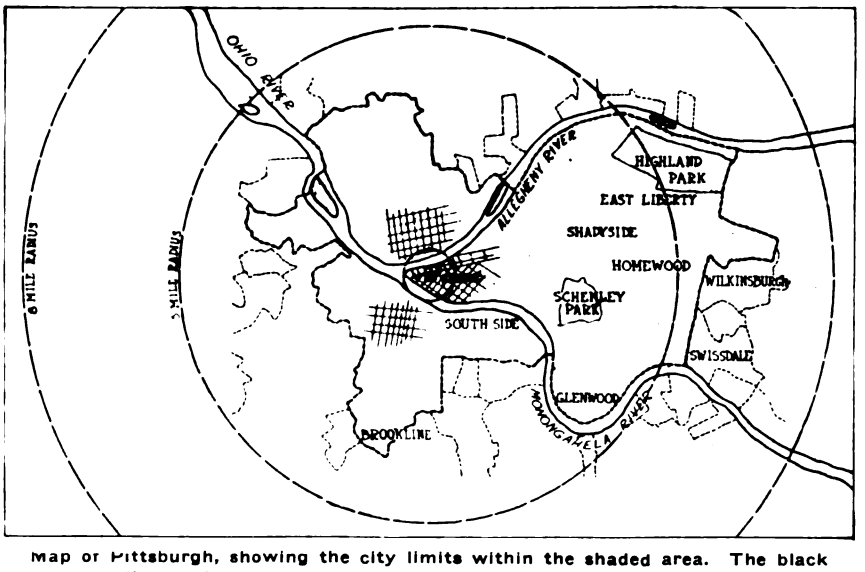
The McCloy company's goods were perhaps no better than those of its competitors. Similarly its prices were commensurate with a reasonable profit. Under these conditions, the only manner in which a more efficient service could be rendered was by offering a quicker and surer delivery. Most of the competitors of the McCloy concern used horses. Koehler decided to use motor trucks.

Department Stores Highly Motorized

Close at hand in the same city were Pittsburgh's department stores, which as a class are the most highly motorized of any in the United States. Of the 2500 trucks of ¾-ton capacity and over in that city, slightly more than 300, or more than 10 per cent, are owned by the department stores. These vehicles have enabled the department stores to render the best possible service to their customers. Most of the stores make at least two deliveries every day within a 30-mile zone and several deliver as far out as 45 miles. Even the smallest of the stores use motors, maintaining fleets of from four to five commercial vehicles.

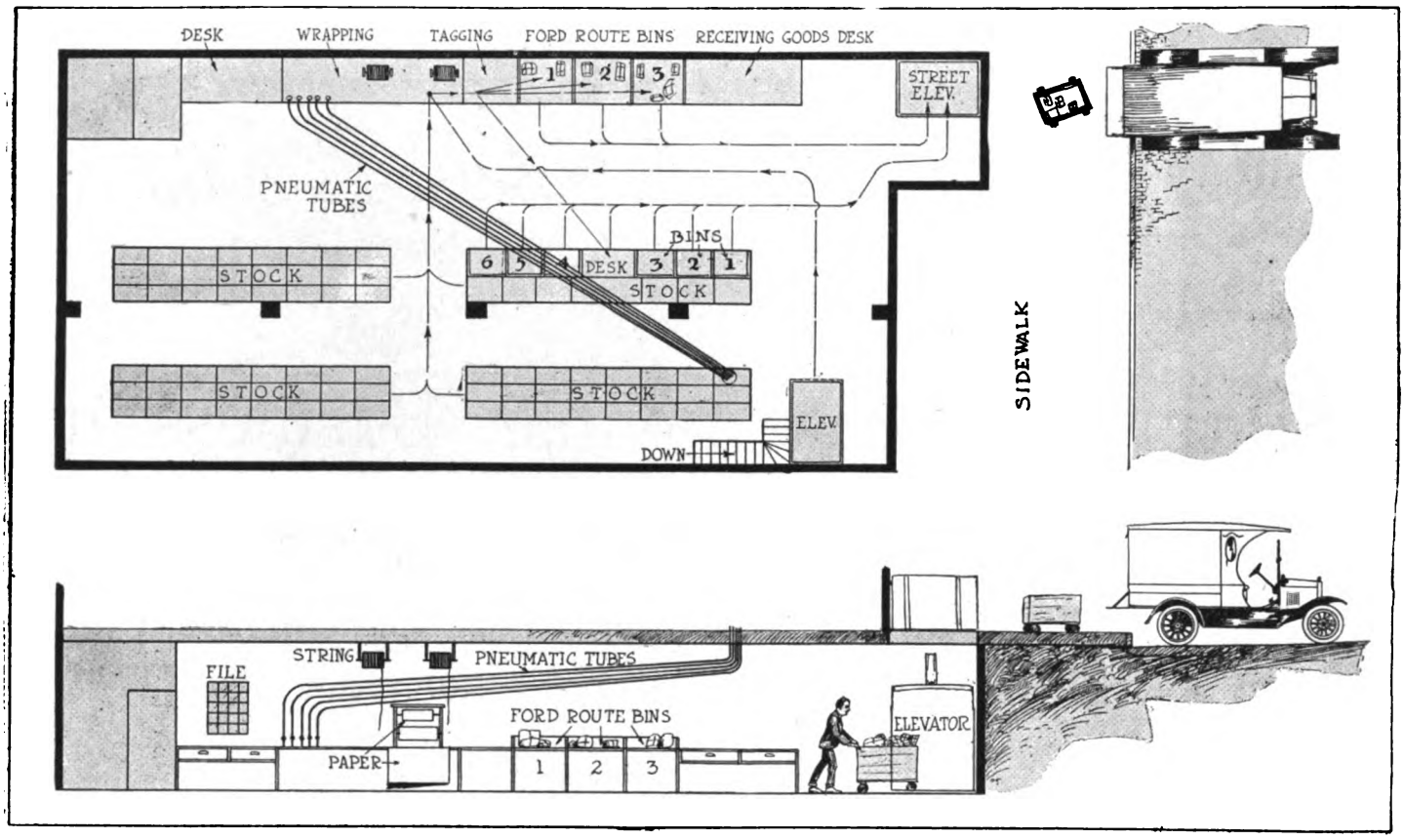
With the reputation of Pittsburgh department stores as a guide, the McCloy company decided that if it were to expand and gain the ascendancy over its competitors it must offer a delivery service equal in reliability and quickness to that offered by practically all of the department stores. To do this meant the purchase of motor trucks. With the trucks purchased, the McCloy company set to work to devise a means whereby it could offer the same class of service.

Just as the department store will deliver anything from a package of pins to the largest piece of furniture, so the McCloy trucks will deliver anything from a 1-ounce bottle of ink to a 300-pound desk or small cabinet safe weighing 1075 pounds as crated. Like the flying squadron of several trucks maintained by many of the department stores to fill rush orders, the McCloy company utilizes one of its vehicles to work in the downtown section of Pittsburgh, where it will deliver an order to its destination within 1 hour after its receipt,



Map of Pittsburgh, showing the city limits within the shaded area. The black square indicates the location of the McCloy store in Pittsburgh's Golden Triangle formed by the confluence of the Allegheny and Monongahela rivers. Deliveries are made every hour in the ½-mile circle drawn about the store as the center. The 5-mile circle indicates the area in which horses formerly made deliveries, while the 8-mile circle shows the increased radius of delivery made possible by trucks

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Plan and sectional elevations of the McCloy shipping room, showing the long desk along one wall at which the wrapping and tagging are done and where the Ford route bins and receiving goods desk are located. The piles of stock on the floor are clearly shown, as is also the sheet-writing desk and the six bins for the Stewart truck used in the stationery delivery between the ½- and 8-mile zones. The dashed lines from the elevator and from the piles of stock show how the goods are brought to the long table and there wrapped and tagged and eventually placed in their proper bins for loading into the small hampers pushed along the floor to a second elevator leading to the street level. The original shipping orders are quickly sent down to the shipping room by means of a series of pneumatic tubes shown in the lower part of the drawing

or even sooner if it is urgently needed. Giving this service, the McCloy company may in reality be termed a businessman's department store.

Besides the ordinary line of stationery carried by the McCloy company, such as ink, pens, pads, paper, books and a thousand and one small things used in the modern business office, it also maintains its own printing plant, where it turns out letterheads, business stationery, pamphlets, catalogs and similar articles and, in addition, handles a complete line of office furniture, including desks, chairs, filing cabinets, bookcases and cabinet safes for the filing of cash, securities or valuable papers.

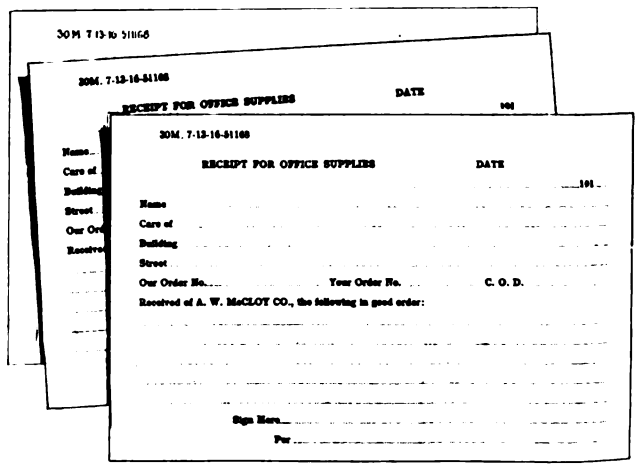
Delivery Radius Doubled

The trucks which the McCloy company purchased had to deliver all of these articles. Whereas the horse wagons formerly used by the concern delivered the great majority of their orders within ½-mile radius, which included the principal downtown section or the Golden Triangle of Pittsburgh formed by the confluence of the Allegheny and the Monongahela rivers, the motor trucks have expanded this radius to 8 miles, in which area both office stationery and furniture are delivered.

After the decision to purchase motor trucks was made, the McCloy company did not rush in and buy a large fleet of trucks before it had made a complete study of its own delivery conditions to find out in exactly what manner the vehicles could be put to the best service and at a minimum cost consistent with the amount of work done.

Accordingly, it first purchased a Ford with a conventional panel delivery body, as shown on page 8. That was 3 years ago. The following year it purchased a 1000-pound Stewart and 1½ years ago another Stewart for the delivery of its furniture. The two horse wagons which were used for all of the delivery work 3 years ago have been disposed of and replaced by the three motors, which now do double the work at a far less cost per unit.

The former horse wagon service cost the McCloy company about $48 a week, being divided up among the two wagons used, at the rate of $24 each. This cost included the horses, wagons and drivers. In the busy season it was usual for the McCloy company to put one of its own men on the wagons as a helper in order that the goods might be delivered within the required time. This helper was paid at the rate of $12 a week, so that the entire cost of the wagons, horses



The triplicate driver's delivery sheet, one copy of which is retained in the shipping room to show that the package has been wrapped, one of which the customer keeps and a third of which is signed by the customer and returned to the store by the driver for record purposes

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and men was $36 for each unit. Of course, in this connection the McCloy company simply hired the wagons from an outside concern, which delivered them at the McCloy store on order each morning. If the season was an especially busy one, the McCloy company would hire an additional wagon by the day to take care of the increased business.

What the Trucks Do

Each of the three McCloy trucks has a special duty to perform. The Ford is used for quick deliveries within the ½-mile radius from the store. The area included within this circle comprises practically the heart of the business section where most of Pittsburgh's tall buildings are located. One of the Stewarts works between the ½-mile zone and the 8-mile radius, delivering small stationery articles exclusively and leaving the furniture equipment, such as chairs, desks, filing cabinets, etc., to the second Stewart, which is provided with a stake body with canvas cover instead of the panel body used on the truck engaged in the stationery delivery.

While it is possible for the 1000 pound Stewarts to reach out far beyond the 8-mile limit, most of the company's business is done within that radius, and it is only occasionally that the vehicle goes out beyond the 8-mile circle.

The Ford makes regular scheduled trips every hour and sometimes at lesser intervals where the goods must be had immediately. It carries only half loads a great majority of the time and is used for that reason instead of the Stewart vehicles because it is easier on the tires, requires less gasoline and is cheaper on that account.

Bonus System Gets Results

In order to obtain the greatest efficiency from its trucks, the McCloy company instituted a bonus system for both of the trucks used in the stationery delivery. Due to the different delivery conditions existing in the ½-mile zone and the 8-mile circle, the systems were deduced on a slightly different basis. For instance, the driver of the Ford working in the downtown ½-mile circle is paid at the rate of $14 a week for delivering packages up to and including 300 per week and receives 1 cent additional for each package above the 300-package mark. Similarly the driver of the Stewart stationery truck is paid $14 a week for the delivery of 200 packages a week or less. For all over 240 he receives a bonus of 1 cent a package. If a helper is employed steadily on either truck, as is the case in the busy seasons of the year, the bonus is divided equally between him and the driver. The McCloy company has found it advantageous to use a helper wherever possible because the standing time of the truck during the actual delivery period is reduced considerably, thereby permitting the vehicle to cover much more ground in a day.

Bonus Responsible for Increased Mileage

This simple bonus system has worked wonders for the McCloy company and has acted as an incentive for the drivers to render the quick service which is necessary if the company is to uphold its reputation as a businessman's department store. In order, however, that this desire for quick delivery may not react to the detriment of the trucks themselves, another bonus of $25 is offered each year for the first year the truck is used, provided no repairs are necessary due to the negligence of the driver. This bonus keeps the truck driver always on the lookout for small details on the chassis requiring attention. One of the greatest failings of the average driver, according to the McCloy company, is his tendency to overlook the filling of the grease cups and inattention to the oiling system.

This small bonus system has overcome these difficulties to a great extent and has also been beneficial in increasing the tire mileage. Although Pittsburgh is noted for its many poor streets and the extreme grades, the average mileage of the pneumatic tires used on the McCloy vehicles is between 5000 and 6000.

The truck bonus system was merely an extension of a similar system used when horse wagons were hired for the company's deliveries. On one occasion the wagon used to haul materials in from the depot to the furniture warehouse and from the store did not give the required service by making sufficient trips between the three points daily. As a result, a bonus of 20 cents for every extra load was offered. This resulted in increasing the loads of two wagons from forty-eight a week to seventy-seven a week, a gain of 62 per cent, or twenty-nine loads at an increased cost of only $5.80 a week.

Due to the small size of its fleet. the McCloy company does not maintain a garage of its own, but keeps the Ford and one Stewart in a private garage at a cost of $10 each per month and the other Stewart in a public garage near the home of the driver. The latter picks it up each morning on the way to the store and returns it each night after the day's work has been done. The charge for the public garage service is also $10 a month, which does not include washing, as the driver is responsible for the neat appearance of his truck and must wash it as occasion demands. The drivers handle all of the minor repairs and adjustments necessary on all three trucks and the major repairs and overhaul work are done at the Stewart branch in Pittsburgh in the case of the Stewarts. Ford repairs are handled at one of the Pittsburgh service stations of that company.

PACKAGE DELIVERY

DAILY EXCEPT SATURDAY

SOUTH SIDE 8:00 A. M.

From P. & L. E. Station East to So. 27th. Street.

LAWRENCEVILLE 8:30 A. M.

From 9th. St. and Penn Ave. and Smallman to 47th and Butler Sts. to Bloomfield. Return Via. Liberty Avenue.

NORTH SIDE 11:00 A. M.

East to McFarlin Ave. West to Island and Preble Ave.

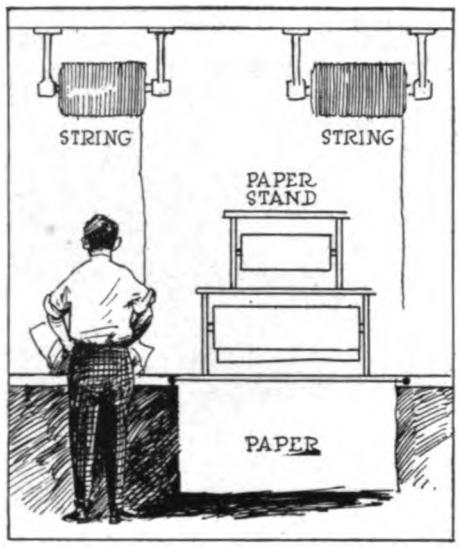
EAST END 3:00 P. M.

Via. 5th. Ave.-Oakland, Shadyside, Squirrel Hill, Homewood, East Liberty. Return Via Grant Blvd.

SATURDAY

LAWRENCEVILLE 8 A. M.
NORTH SIDE 10 A. M.
EAST END 1 P. M.

One of the McCloy package delivery schedules, showing the four trips made per day between the ½-mile and 8-mile zone and the area covered by the truck on each trip



A detail of the wrapping space in the McCloy shipping room, showing how the string or cord is carried on two reels suspended from the ceiling beams directly in front of the paper. The latter is carried on two rolls on a steepled stand with the large sheets carried on a wire wound around two eye-bolts screwed into the edge of the table. Both the paper and string are always within arm's reach of the wrapper. This makes for quick package wrapping

How Drivers Are Picked

The drivers of the McCloy trucks are selected first on their ability to drive and, second, on their knowledge of the city lay-out. Pittsburgh streets are so cut up and irregularly placed that a novice on the street location would waste a large part of his time in finding the points on his delivery route, rather than actually covering ground. In many instances drivers use one of the several inclines which were described in the February 1, 1917, issue of THE COMMERCIAL VEHICLE and which eliminate the long tedious uphill runs otherwise necessary to reach the outlying hills surrounding the Allegheny and Monongahela rivers just above their junction with the Ohio.

The use of motors instead of horses has also necessitated a certain speeding up in the internal handling of the packages. This work has been carried out as shown in the large plan and sectional

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One of the two 1000-pound Stewarts used by the McCloy company. The one shown above is equipped with a slat-sided body with a top and tarpaulin cover and is used for the delivery of articles of furniture such as office desks, chairs, filing cabinets and so on. Note that the low-sided panel on the body is well utilized for advertising purposes and contains the concern's slogan of "The Business Man's Department Store," together with its trade-mark sign consisting of the name McCloys on a white elliptical background

view of the shipping room given in the illustration on the top of page 6. The shipping room is in the basement. A certain amount of stock is carried on the small wooden stands on the basement floor as shown on page 6. When large orders are received the stock is taken direct from the supply in the basement. Should the article purchased be carried in stock on one of the upper floors of the McCloy building, it is sorted out on that floor and then transferred by means of a large elevator to the basement, where it is wrapped and routed in the ordinary way.

The shipping room is well arranged and consists of one long table on one side of the building and a desk and bins in the center, as shown on page 6. All of the goods are brought to one end of the long table along the side wall, where they are wrapped and the delivery tags affixed. The packages are then transferred to the particular bins where they are kept until the arrival of the truck for its next delivery run. In this way the goods are always ready for the trucks on their return and idle standing time waiting for loads or sorting out particular packages for any one trip is eliminated.

The route bins are divided into two main groups, one for the Ford working in the downtown section and the other for the Stewart delivering stationery materials between the ½-mile and 8-mile zones. The packages to be delivered by the Ford are placed in one of three bins near the end of the long table where they are most readily accessible from the sidewalk level by means of the elevator leading down into the basement.

The stationery goods to be delivered by the Stewart are placed in six bins in the center of the basement, at one end. These are collected for each of the routes in the same manner as are the packages in the ordinary department store. From the bins the packages are transferred to the truck at the curb line by means of small wheel boxes or hampers which are rolled out to the front of the store onto an elevator which leads from the basement to the sidewalk. As the packages are taken out of their respective bins they are placed in the hamper in the reverse order of their delivery so that when they are removed from it, the packages that are to be delivered first are directly behind the driver's seat where he may reach back for them without difficulty.

When orders to be filled are taken from the stock in the basement, the actual order blanks, which are made out in triplicate by the sales person, are sent to a desk in the shipping room adjacent to the wrapping table by means of a series of pneumatic tubes. One clerk at this desk keeps a record of all the orders received as a means of checking against the orders delivered by the several drivers.

In order that mistakes in deliveries may be easily found and rectified quickly the tags for each package are made out in triplicate. One goes to the shipping clerk, one goes to the customer and one which the customer signs is returned to the driver to indicate that he has delivered the goods in good order. These forms are shown at the bottom of page 6.

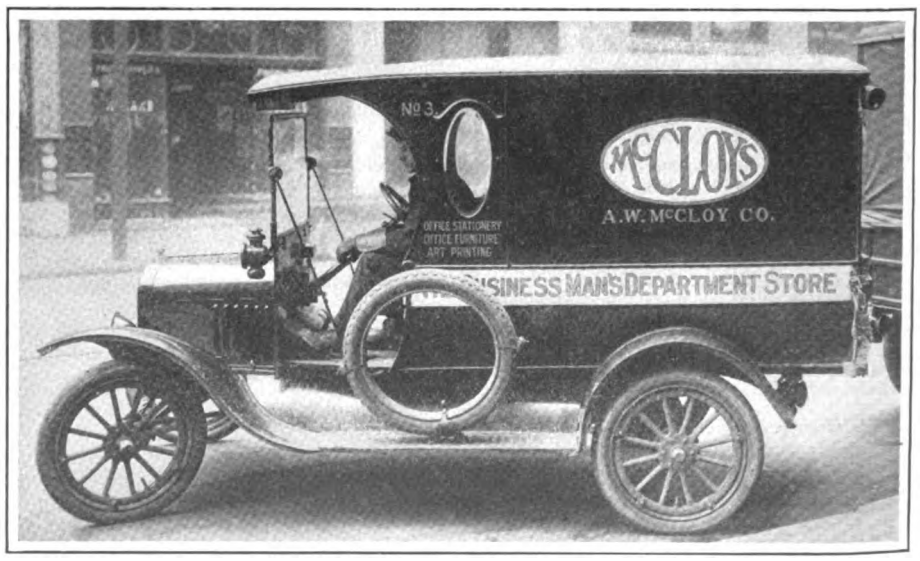
Incoming goods are taken down from the street on the same elevator on which the outgoing deliveries are carried and are recorded at a receiving goods desk at the end of the wrapping table nearest the elevator. At that point they are either put into stock in the basement or carried up on the elevator to the various departments on the upper floors.

How Goods Are Wrapped

One particular time-saving feature for the package wrapping is the manner in which the cord or string to tie the packages is carried. It is carried on two reels suspended from the under side of the basement ceiling beams. The ends of these rolls of cord hang down directly in front of a steepled paper rack so that the wrapper has both paper and string within reach at all times. For large packages big sheets of paper are suspended on a stout wire fastened to two eye-bolt hooks screwed into the edge of the table. These may be turned to tighten the wire so that a large sheet of paper may be torn off in half sections by the tightness of the wire against it.

Most of the furniture sold by the company is delivered direct from its warehouse to the purchaser, only sample units from which selection can be made being carried in the store.

The times of departure of the trucks from the store on their regular routes have been arranged so that they do not conflict, in order that shipping room congestion and truck delays incident to it because of the inability to get the



The McCloy company's Ford used to make deliveries within the ½-mile zone about the store, which includes the heart of the Pittsburgh business section. Again note the company's slogan, "The Business Man's Department Store," and the utilization of the panel side for advertising purposes

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packages up on the one elevator to the tailboards may be eliminated.

Package Delivery Costs

During the greater portion of the past year some interesting figures on the cost of package delivery have been compiled from the records of the McCloy company, which show, for instance, that the Ford working in the ½-mile zone with a new man as driver delivered 930 packages per month at a cost of 12.9 cents per package. With a well-broken-in man this figure can be reduced to approximately 9 to 10 cents per package. As a check against this cost, the McCloy company hired boys to deliver packages in the same area as that in which the Ford works, and the cost for an average of 2130 packages per month for a 7 months' period was 4½ cents. Although this cost is almost half of what it costs to deliver by motor vehicles, the service fluctuated greatly and was therefore not considered desirable. In the morning when the boys were fresh, the packages were delivered with a great rush, but as the day wore on and the boys became more tired, there was a perceptible slackening up in the rate of delivery. For these reasons the McCloy company utilizes its Ford for practically all of the deliveries in the downtown section except in the extremely rush seasons, when the service of a second motor would not be required by the volume of business but where one or two boys would fit in admirably well.

Other figures covering a 7 months' period for the truck used in the delivery of small stationery articles as far out as the 8-mile zone showed that 1518 packages per month had been delivered at an average cost of 10.7 cents.

A 6 months' record on the cost of delivering articles of furniture such as desks, chairs and the like showed that on an average of 388 articles had been delivered each month at an average cost of 41.5 cents.

Our London Letter

By R. Douglas-Vickers

FARM TRACTOR SITUATION NOW LEADING TOPIC IN GREAT BRITAIN—U-BOAT PERIL IS A REAL ONE

LONDON, ENGLAND, April 15—The fear of starvation of Great Britain's population due to the U-boat peril has given the farm tractor a great impetus in this country. Several millions of acres must be broken up for tillage in order to insure sufficient home supplies of food during the coming winter.

It is expected that many motor truck manufacturers will soon enter the farm-tractor field. The Ministry of Munitions has ordered a conference of leading British motor firms to formulate a method for the production of farm tractors on a large scale.

From what I can learn, the explanation of this is put briefly, that facilities are to be given for the erection of Henry Ford & Son's new factory at Cork, Ireland, where it is stated the new Ford farm tractor is to be produced. The rather sensational news is also published that the output of the Ford factory is to be 50,000 per annum, which if it be true will be a rather formidable opposition to any British scheme that may be put up. However that may be, I think we are safe in concluding that the British agriculturist will stand to benefit by the competition. Of course, it will take some time for those plans to mature, but it is highly important to note that the change in British agricultural policy is calculated to come to an end in 5 years, although that is the period of price guarantee for all wheat growers.

There are, roughly speaking, some twenty-five or thirty firms making commercial vehicles in the United Kingdom, but I shall be very surprised, indeed, if more than one-third of these actually interest themselves in tractor work. They are fully conscious of the dangers of a dispensal of their efforts, especially when all the lessons of the war are teaching them the value of concentration on the major pursuit, which in this case is, of course, trucks. Here they are finding that the fewer models they have the more fully standardized the better, so that to add another product to their program, and of one which they have very little knowledge indeed, would look like a gigantic gamble. Will they risk it? The answer to this is certainly in the lap of the gods.

American Tractors Selling

On the other hand, some motor manufacturing concerns and large numbers of motor dealers have taken up the representation of American-built tractors, but at the moment shipping facilities are practically unobtainable or obtainable with the utmost difficulty. One of our biggest concerns—the Austin Motor Co. of Birmingham—which makes both passenger cars and commercial vehicles, announces the fact that it is interesting itself in the question of agricultural tractors, and expresses the belief that in that field it can render another service to the nation. For the present it has decided that it cannot spare any portion of its extensive works to produce its own tractors, the urgency of the position brooking no delay for designing and experimenting. It has, therefore, done the next best thing in making arrangements to import, from the United States, I believe, well-tried and thoroughly satisfactory machines of a standard that they can recommend. These are, however, to undergo certain modifications to suit the conditions in this country.

This venture is, of course, to be backed by the resources of the Austin company's extensive factory and an extremely important consideration in regard to the maintenance of spares and supplies. A special staff of experts is to be at the disposal of the user to demonstrate and advise. The Austin people consider that the present incentive of price for farm produce should mean a large demand for economical tractors of tested merit, and they believe that by entering into this fresh development they will still further extend their reputation.

This company has recently been granted permission by the Ministry of Munitions to supply to approved customers its 3-ton commercial vehicles, of which so many thousands are in military service. As a result of its war work in many lands, the Austin company has secured a valuable mass of experience as to its performance, with the result that quite a number of valuable improvements have been incorporated in the design. They are, however, mainly in respect to details. An interesting point in connection with the Austin truck is the fact that in the face of severe competition and conforming to a great many stipulations, the makers secured the contract to supply the Russian government with 2000 trucks on this 3-ton chassis model, which is regarded here as being the largest single order for one model.

India Imports Cut

The restriction of imports into India, which came into force recently, is, I am told, occasioning much hardship in commercial circles. It seems that a great many firms were prepared to import American commercial vehicles and, in fact, were being compelled to do so by the experiences of their businesses. Now they say that in consequence of the import restrictions their work will suffer seriously, and unfortunately much of it is of a very important character. As usual, it is a question of freight, and until the submarine menace is mastered the difficulty is likely to continue.

So far as the imports into England are concerned, these are practically at a standstill. The principal importing houses have many orders on their books, but the shipping difficulty still governs the situation. Engineers in trade circles have elicited the information that there is no difficulty in getting the necessary license to import, as few trucks are wanted for work that is not of real national importance. Except in connection with the department stores, there is little of what might be described as transport and more often than not it is usually the provisions and foodstuffs departments that make the most use of the motors.

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A Prophecy on Army Trucks Come True

IN the leading article of the April 15, 1917, issue of THE COMMERCIAL VEHICLE it was pointed out that a need for special army motor trucks of 2- or 4-ton capacity, or any other capacity for that matter, was a very debatable question. Our army specifications were admittedly based on our experience in Mexico, where because of a lack of roads it was considered a crime to send any kind of a truck and expect it to stand up. It was pointed out that such service might be necessary in an emergency but that it certainly is not necessary in the scientifically planned warfare as carried out in Europe to-day and under which all of our trucks to be sent abroad must work.

Our standard chassis trucks performed admirable service in the defense of Verdun, which was victualed and munitioned solely by trucks because of the entire lack of railway facilities. No complaint has been heard that these standard commercial service trucks were not robust enough to stand the demands put upon them.

It was also pointed out that it was inadvisable to attempt to force our truck makers to disrupt their plants in order to produce a new type of truck and thereby throw into chaos their regular commercial business which England's and France's experience has taught us must be carried on without interruption in modern warfare where it is nation against nation and not only army against army.

This prophecy came true this week when the government advised truck makers that it would not adhere to its intended course of accepting only truck bids according to the letter of its stringent specifications. It is doubtful if even a score of makers would have placed bids on the 76,000-odd trucks that are now contemplated as necessary to fill the present needs of our armed forces. The good showing of 101 makers tendering the bids, which were opened this week in Chicago and which are given in full elsewhere in this issue, was only possible because of that decision.

This sensible course pursued by the Quartermaster's Department will have two great advantages. First, it will enable the government to get its required number of trucks quickly, and second, it will not disrupt the truck companies' business in supplying trucks to private owners who will be called upon to do just as important a work as the war trucks, namely, the keeping open of our lines of industrial communication at this critical period when the railroads are greatly overtaxed.

The Coming of the Metal Wheel

THE metal truck wheel is coming fast. It is undoubtedly the truck wheel of the future. It has many advantages over the wood type which should make it a money-saver to every truck user. The fact that the recent United States army truck specifications call for metal wheels on Class A and Class B trucks will undoubtedly give the metal wheel the psychological push required to make its popularity secure.

For the army truck, the metal wheel has many apparent advantages, such as the ability to withstand gunfire without damage, its ability to keep in round irrespective of weather conditions and its ability to withstand a greater amount of abuse of all kinds than the wood type.

The advantages of the metal wheel for the commercial truck user are not so well known, however, possibly because of the slightly greater cost of the metal wheel as compared with the wood. To the average truck user, perhaps the greatest advantage of the metal wheel is its ability to keep in round. Wheels out of true are responsible for excessive tire costs. These are just as destructive on tires and chassis as a flat locomotive wheel or railway coach wheel is to the engine or car. The only reason the average truck owner has not thought of this is that the damage is going on silently because of the truck's rubber tires, whereas the flat railway or trolley-car wheel proclaims its inefficiency to the world by the noise which it makes.

Again, tire companies will tell you that every wood wheel must be trued up each time a pressed-on-type tire is fitted. This costs the user money.

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Truck Exports Are On Decrease

1,039 Shipped Abroad in April —Canada Big Customer

NEW YORK, June 14—Motor truck exports fell off during April, 1917, to one less than in March, 1917, and 751 less than April, 1916. The total shipped was 1039, with a valuation of $2,416,368, whereas the March exports were 1040, valued at $2,961,389. In April, 1916, there were 1790 trucks shipped, valued at $5,259,480. Canada was a better customer than the year before, buying 2937 motor vehicles in April, 1917, as against 2130 in April, 1916.

FEW MOTOR TRUCKS IN ENGLAND

LONDON, May 15—Motor trucks have shown a steady growth in Great Britain since 1907, but London commercial traffic is only one-eighth motorized, according to tests made of Fleet Street traffic. There are about 30,000 motor trucks in use in the British Isles now and 150,000 chassis could be used before the horse would be driven out of business.

OHIO SHOWS BIG TRUCK GAINS

COLUMBUS, OHIO, June 10—There are fully 25 per cent more motor trucks in use in Ohio than at this time last year, according to the estimates of State Registrar McCurdy.

WILL ELIMINATE HORSE COMPETITION

WASHINGTON, D. C., June 2—The Government is in the market for 250,000 horses and mules for army use. This is expected to create a dearth of horses and stimulate the use of motor vehicles for commercial purposes.

36,278 REGISTRATIONS IN KENTUCKY

LOUISVILLE, KY., June 7—Collections by the office of Commissioner of Motor Vehicles to date this year have been as follows: Thirty-six thousand two hundred and seventy-eight motor vehicles licenses, $244,577.93; 1097 motorcycle licenses, $5,118.82; chauffeurs, new and renewals, $2,824, which totals $252,530.75. This is $67,000 more for 5 months than for the entire year of 1916.

INTERCHANGEABLE PARTS FOR TRUCKS

WASHINGTON, June 3—It will be possible to have the military motor trucks, for which bids are now being opened, so constructed that the engines and transmissions will interchange from one vehicle to another. This is the decision arrived at as a result of a 2-day meeting of engine, transmission and complete motor truck manufacturers concluded to-night.

The details are not yet fully worked out, and weekly meetings will be held in Detroit or in Washington until the task is done. It is understood that sizes and strengths will be figured on the assumption that the class A truck has a capacity of 2½ tons and the class B a capacity of 5 tons. In other words, the Society of Automotive Engineers considers the military trucks as specified suitable for these loads.

Agreement upon standardization of so wide a scope marks a stage of development far ahead of anything heretofore attained by the S. A. E. Executives from a number of the automobile factories met recently at the Detroit Athletic Club to discuss suitable specifications under which to manufacture supplies for the Government and also the matter of the proposed motorization of the field artillery. Captain W. E. Dunn stated that 5400 trucks would be needed within the next year for the army of 1,500,000 men which the Government plans to send abroad.

URGE FEDERAL AID FOR SOLDIERS' DEPENDENTS

WASHINGTON, D. C., June 4—Affecting practically every employer in the United States is the recommendation that the Government enact legislation providing for reasonable separation allowances to be paid to the dependents of the enlisted personnel of the army and navy, basing such compensation on the number of dependents in each family. Such action is advocated in a report made to Secretary Baker as chairman of the Council of National Defense by a special committee of the Chamber of Commerce of the United States, in response to a request from Mr. Baker asking for a report on the matter of voluntary civilian assistance in this matter.

FEWER HORSES IN LOS ANGELES

LOS ANGELES, June 10—In Los Angeles County, Cal., a recent report shows that there are less than half of the number of horses there to-day than there were in 1900, and in the meantime the number of registered motor vehicles in the same county has increased from six to 79,146.

In 1900 there were on the county assessor's books 47,000 horses valued at $5,000,000. There were just six motor cars valued at $8,400. The next 10 years reduced the number of horses to 31,000, having a value of $3,000,000. The automobiles numbered 11,000, having a value of $15,400,000. During the ensuing six years the horses dropped down to 20,000, while the automobiles jumped nearly to the 80,000 mark, with a total value of nearly $100,000,000.

1582 VIMS IN MAY

PHILADELPHIA, June 11—During May the Vim Delivery Co. built 1582 vehicles and sold 4247.

COMMERCE CHAMBER URGES WAR PUBLICITY

WASHINGTON, June 2—Publicity is needed to make the people realize that this is to be a long war, in the opinion of the Chamber of Commerce of the United States; and it requests its members to wire the Government urging an educational campaign along these lines.

DETLAFF TO MAKE TRUCK CLUTCHES

DETROIT, June 6—H. L. Worbois has been appointed chief engineer and production manager of the A. J. Detlaff Co., which is opening a new clutch department to manufacture a new design of disk clutch for automobiles, trucks and tractors.

Army Truck Tires for All Users

U. S., Kelly, Firestone and Goodyear To Make Government Type Tires

NEW YORK, June 14—The United States Tire & Rubber Co. is making demountable type tires to meet the new army truck tire specifications which were outlined in the May 15, 1917, issue of THE COMMERCIAL VEHICLE, and is ready to make immediate deliveries. Kelly-Springfield, Firestone and Goodyear will also make the army type of tires in large quantities.

The significance of the move is that the new type will be sold to commercial users as well, and this may affect the present popularity of the pressed-on type solid tire.

PLANS CHAIN OF ACCESSORY STORES

NEW YORK, June 9—The Motor Accessories Corp., incorporated in Delaware for $2,000,000, plans to open two branches in every State in the Union to handle nationally advertised accessories for passenger cars and trucks. The corporation will sign up one service station in each town, and there will be a branch in New York and one in Chicago, with sub-stations in each city. The first plants will be opened in Newark, N. J., with Philadelphia, Buffalo, Pittsburgh, Brooklyn, New York, Denver, Chicago and Detroit following.

The corporation will operate its own plant in Sandusky, Ohio, manufacturing dry cells, grease guns, air pumps and carbureters. Some of the men behind the organization are: R. W. Thompson, of Thompson, Warren & Pelgram, attorneys, 52 Wall Street; Henry L. Redfield, 16 Court Street, Brooklyn, real estate; W. Morris Griscom, Philadelphia, and H. F. Vortkamp, formerly with the Mayer Carbureter Co. and the Candler Radiator Co. The corporation has opened offices at 170 Broadway.

HEASLET RETIRES FROM STUDEBAKER

SOUTH BEND, June 9—James G. Heaslet, vice-president in charge of engineering for the Studebaker Corp., has retired, but will continue a member of the board of directors, and has been retained in the advisory capacity of consulting engineer. His place as vice-president has been taken by M. F. Wollering, formerly production manager. Mr. Wollering, who has been associated with the Studebaker Corp. for many years, will be in charge of manufacturing at the Studebaker plants in Detroit, South Bend and Walkerville.

FORD PROFIT $21 PER CAR

DETROIT, June 6—Vice-President Klingensmith of the Ford Motor Co. stated in the Dodge-Ford suit that Ford cars cost $260 each to make and are sold to dealers for $281, giving the company a profit of $21 per car. He said the Ford company aims to make 12.01 per cent gross on $250,000,000 business this year.

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Two Truck Firms Will Raise Prices

Atterbury and Service New Schedule Effective Shortly

NEW YORK, June 14—Two motor truck firms have announced new price schedules. Service truck prices will go up June 20, and Atterbury July 1. Atterbury will shortly discontinue manufacturing its 1-tonner. The truck price changes are as follows:

Truck	Tons Cap.	Former Price	New Price
Service	1	$1,375	$1,500
Service	1½	1,950	2,300
Service	2	2,250	2,500
Service	3½	3,000	3,300
Service	3½ special	3,250	3,600
Service	5	4,000	4,300
Atterbury	1½	2,075	2,225
Atterbury	2	2,575	2,750
Atterbury	3½	3,375	3,575

DRIGGS-SEABURY NOW SAVAGE ARMS CORP.

NEW YORK, June 2—The Driggs-Seabury Ordnance Co., of Sharon, Pa., has acquired all the property and assets of the Savage Arms Co., of Utica, N. Y., and changed its name to Savage Arms Corp. Both plants will continue to be operated.

REPUBLIC TO BUILD IN CALIFORNIA

ALMA, MICH., June 9—The Republic Motor Truck Co. will shortly erect an assembly plant at a cost of $175,000 in some large center in California. The plant will give employment to 300 men. The Republic Motor Truck Co., now turning out 100 trucks per day, is planning to double its capacity within the next few months and to manufacture about 50,000 trucks of two models, one similar to the present large model and the other with a three-quarters ton capacity in 1918.

ONEIDA DELIVERS FIRST TRUCK

GREEN BAY, WIS., June 9—The first Oneida truck to be manufactured by the Oneida Motor Truck Co., incorporated recently with a capital stock of $300,000, left the shops on Wednesday, June 6, and marked the beginning of the initial output of commercial cars by the new company. The truck is equipped with a Continental motor, Hele-Shaw clutch, Cotta gearset, Spicer universals, Timken front and rear axles, Bosch ignition, etc. Worm drive is employed.

FAGEOL STARTS TRUCK PLANT

OAKLAND, CAL., June 9—The Fageol Motors Co. to-day celebrated the starting of its new $500,000 motor car, truck and tractor factory. The celebration included flag raising and salute, ground breaking, motor car race of cars 15 years or older, and a speed race with a Fageol car participating, and a demonstration of the Fageol tractor.

MUSKEGON TO BUILD TRUCKS

GRAND RAPIDS, MICH., June 10—At the annual stockholders' meeting of the Universal Valveless Four Cycle Motor Co., Grand Rapids, Mich., it was decided to change the name of the company to the Muskegon Engine Co. In addition to the manufacture of its line of engines, this company will soon announce a new line of motor trucks of 1 and 2 tons capacity, preliminary arrangements for the manufacture of same having been under way for some time. The company has purchased a 40-acre tract of land at Muskegon, Mich., and will build immediately a large modern factory, plans for which are now being prepared. The general offices, formerly at Grand Rapids, Mich., and the engineering department at Toledo, Ohio, have been moved to Muskegon.

WINTHER MAY LOCATE IN WINTHROP HARBOR, ILL.

MILWAUKEE, WIS., June 11—It is reported that the Winther Motor Truck Co., of Kenosha, Wis., organized several months ago by M. P. Winther, formerly of the Thos. B. Jeffery and Nash Motors companies, has definitely decided to establish its motor truck works in Winthrop Harbor, Ill., a village on Lake Michigan, a few miles south of Kenosha.

MORGAN POTTER TO MAKE TRUCKS

BEACON, N. Y., June 9—The Morgan Potter Mfg. Co. is changing its name to the Morgan Potter Motor Co. and will devote its plant to the manufacture of a light truck and truck converters. Morgan Potter, president of the company during its 30 years' experience as a carriage accessory maker, continues at the head of the business.

All products of the company will bear the name Beacon.

HIGRADE SELLING STOCK

GRAND RAPIDS, MICH., June 11—The Higrade Motors Co., organization of which was announced in a previous issue of THE COMMERCIAL VEHICLE, will sell $115,000 worth of stock still in its treasury at $10 per share, which is the par value. The Higrade truck is over 1500 lb. capacity. The price has not yet been given. The Higrade truck is described elsewhere in this issue.

LOUISVILLE WANTS FACTORIES

LOUISVILLE, KY., June 9—The Louisville Industrial Foundation has been formed with $1,000,000 at its disposal to use for attracting flourishing business enterprises to the city. This money is not to be used for bonuses, but to provide working capital.

Coming Events

June 18.....Ottawa Beach, Mich., Meeting Standards Committee, S. A. E.

June 19.....Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.

June 20.....New York City, Monthly Meeting of the Motor Truck Club of America at Noontime.

June 20.....Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.

June 25-26.....Washington, D. C., Summer Meeting S. A. E., Bureau of Standards.

June 26.....Washington, D. C., Informal Dinner of the S. A. E., New Willard Hotel.

N. Y. Post Office To Build Garage

Will House 250 Mail Trucks—Floor Space 67,750 Sq. Ft.

NEW YORK, June 11—The Post Office Department is to run its own garage hereafter. The United States Government has agreed to pay $600,000 rent during the next 10 years for a garage to house 250 of its mail trucks. The building will be located at 310-328 West Thirty-eighth Street, and will run through to West Thirty-seventh Street. The building probably will cost $300,000 and will have an available floor space of 67,750 sq. ft. Heretofore the post office has maintained its trucks in public garages, and this is the first step toward government ownership of such buildings in New York. It is planned to have government garages in other boroughs in the near future.

U. S. TRUCK SALES $1,672,000

CINCINNATI, OHIO, June 11—Sales of the United States Motor Truck Co. for the first quarter of this year totaled $1,672,000.

The company has purchased a large plot of land adjoining its factory at Covington, Ky., and will erect an addition.

$2,000,000 MENOMINEE TRUCK ORDER

NEW YORK, May 29—The Menominee Motor Truck Co. has received an order for trucks amounting to $2,000,000 from the Claud Nankivel Co. Mr. Nankivel is now in Moscow, Russia. According to plans, 200 trucks are to be delivered this month. The contract further provides that the price will be full and the terms of sale 25 per cent in advance and the balance f.o.b. Menominee.

AMERICAN COMMERCIAL CAR OFFERS STOCK

DETROIT, MICH., June 9—The American Commercial Car Co. is selling stock to raise funds for the manufacture of a ½-ton delivery car to be assembled from standard parts. The company now owns the American Machine Works, operating a general machine shop.

SUPREME MOTORS TO START PRODUCTION

CLEVELAND, OHIO, June 10—The Supreme Motors Corp. has purchased a 22½-acre factory site in this city, where it will erect a building in which will be manufactured Supreme 4-, 6- and 12-cylinder motors. The company expects to produce 7500 motors the first year. Courtney N. Mitchell, of the Denneen Motor Truck Co.; B. J. Cline, of Chandler, and C. F. Jamison are among those chiefly interested.

NEWMAN HANDLES RAINIER

NEW YORK CITY, June 12—The newly organized Harry Newman-Stratton Co. of Chicago has closed a contract with the Rainier Motor Corp. whereby it becomes distributer for the northern part of Illinois, Wisconsin and the eastern part of Indiana for the Rainier worm-driven ½-ton truck.

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New Drastic Truck Law in Texas

Levy on Capacity, Horsepower and Valuation

DALLAS, June 14—Texas will have a drastic new motor vehicle law on July 1. Under this act motor trucks will have to pay 35 cents per horsepower over 30 hp., 60 cents per $100 valuation to the State, 54 cents per $100 valuation to the county, license fee of $3, and a capacity tax as follows:

Weight in pounds per wheel	Fee
1001 to 2000	$ 20
2001 to 4000	40
4001 to 6000	60
6001 to 8000	150
8001 to 10,000	300

For loads greater than 10,000 lb. per wheel license fees shall be charged for each vehicle at the additional rate of $500 for each 1000 lb. increase in weight. or fraction thereof.

In addition many of the cities tax vehicles as high as $1.80 per $100 valuation. At this rate the total yearly fees for a Ford amount to $17.25, with heavier vehicles paying heavier rates.

NEW OHIO SPEED LIMIT FOR TRUCKS

COLUMBUS, OHIO, June 11—Recent laws passed by the Ohio General Assembly effecting the operation of motor trucks will soon become effective, permitting 90 days for the filing of referendum petitions. One of the laws fixes the speed limits at 8 m.p.h. in business and closely built up sections of municipalities; 15 m.p.h. in other city districts and 25 m.p.h. on country roads.

Another law compelled all vehicles, except hand-propelled and hay and straw wagons, to carry lights visible to the front and rear after dark and until daylight, on all roads and streets of the State. Formerly lights were regulated by all municipalities and no law compelled vehicles on country roads to have lights.

LOS ANGELES RESTRICTS JITNEYS

LOS ANGELES, CAL., June 11—The latest attack upon the motor vehicle transportation development in California fathered by the intense opposition of the Railway Corporations is an ordinance excluding jitneys from the principal business streets of the city.

MONTREAL DEALERS OPPOSE PRICE BILL

MONTREAL, June 11—The Montreal Automobile Trade Assn. has gone on record against a bill in the Canadian Parliament which would make price fixing agreements criminal. The association recommends instead an international trade commission of business men to pass on all agreements.

MONTREAL DEALERS GET CONCESSION

MONTREAL, CAN., June 9—As a result of the resolution protesting against outside dealers being allowed to tender on trucks and accessories for the city of Montreal, the Montreal Trade Assn. has obtained a concession in favor of local dealers, and the qualification has been inserted in all specifications that tenders shall submit evidence that they are bona fide manufacturers of flushing, sweeping or similar machines and trucks, that they have adequate plant and equipment for the manufacture of the flusher sweepers and trucks, and for the local manufacture or furnishing of parts necessary for replacement at reasonable cost and without delay.

CLIFTON AGAIN HEADS N. A. C. C.

NEW YORK, June 8—Charles Clifton, head of the Pierce-Arrow Motor Car Co., has been re-elected president of the National Automobile Chamber of Commerce. Other officers for the year are: Vice-president, Wilfred C. Leland of Cadillac; division vice-presidents, Hugh Chalmers of Chalmers, Windsor T. White of White, and Herbert H. Rice of Oakland; R. D. Chapin of Hudson, secretary; George Pope, treasurer, and Alfred Reeves, general manager.

John F. Dodge, of Dodge Brothers, Detroit, has been elected to the directorate.

MID-WEST SECTION S. A. E. ELECTS

CHICAGO, June 2—C. H. Whitney, sales engineer of the Willard Storage Battery Co., was elected chairman of the Mid-West Society of Automotive Engineers at the regular quarterly meeting of the section at the Chicago Automobile Club last night. Whitney succeeds F. E. Place, of the Buda company, who automatically becomes vice-chairman. Darwin S. Hatch, editor of *Motor Age*, was re-elected secretary, and George L. Lavery, western manager of the West Steel Castings Co., was elected treasurer, succeeding Charles W. Stiger, president of the Stromberg Motor Devices Co.

N. Y. MERCHANTS ASSN. OFFERS FREE SERVICE

NEW YORK, June 10—The Merchants Assn. of New York offers its services free of charge to companies expecting to locate factories in this city. It is in touch with the various sites and facilities which the city offers and can give expert advice.

INDUSTRIAL ENGINEERS ORGANIZE

CHICAGO, June 1—The Society of Industrial Engineers, a permanent national organization, the membership of which is to comprise industrial engineers, professional technical engineers, accountants, managing executives of commercial and industrial activity, writers, educators and students, was organized in this city recently. Charles Buxton Going, for 20 years editor of the *Engineering Magazine*, New York, was chosen provisional president and pro tem chairman of the board of directors.

WILLYS-OVERLAND RETIRES SOME PREFERRED

TOLEDO, June 9—The Willys-Overland Co. will retire 4500 shares of preferred stock on July 1. These shares will be bought at the market price. The company's charter calls for the retirement of 3 per cent of all outstanding preferred stock this year.

Expect Tire Price Rise Early in July

New York Dealers Call July Increase Inevitable

NEW YORK, June 14—Inquiries among the New York branches of a number of the tire companies to-day revealed the fact that a rise in truck tire prices is contemplated for the early part of July. No definite schedules have as yet been announced by the respective factories, but the price of raw materials for solid tires especially has gone up to such an extent that certain of the leading dealers have indicated that an early increase is inevitable.

TWENTY-TWO NEW BUSES FOR BALTIMORE

BALTIMORE, June 12—The United Railways of this city has ordered twenty-two new buses for delivery about the middle of July. The contract went to the J. G. Brill Co. The new vehicles will have a seating capacity of twenty-two persons and will displace the buses at present in use which accommodate only twelve passengers.

FORD TRUCK ALMOST READY

DETROIT, June 14—According to reliable reports, the first Ford trucks will be shipped within the next 30 days to a large number of agents as demonstrators.

BIG TRUCK ORDERS FROM MEXICO

LAREDO, TEX., June 13—An unexpected and rapidly growing demand for motor trucks is coming from Mexico and many carloads of these vehicles have entered that country through El Paso, Eagle Pass and Laredo during the last 3 or 4 weeks. The shipments are constantly increasing, the demand coming chiefly from the larger mining companies that are re-opening their respective properties. Most of the orders for motor trucks for Mexico shipment are placed with dealers in cities and towns on or adjacent to the Rio Grande, particularly San Antonio and El Paso.

JOHNSON HEADS LOS ANGELES MOTOR TRUCK CLUB

LOS ANGELES, June 13—The Motor Truck Club of southern California is now entering upon its fifth year of activity. The club has been the leading factor in promoting the fight for reasonable regulation of truck operation and against freak measures introduced in the legislature which would have been extremely injurious to truck owners and the trade. The officers of the association recently elected for the current year are: President, F. W. Johnson, of the L. A. Ice & Cold Storage Co.; vice-president, M. M. Priver, of Priver's Auto Delivery Company; treasurer, W. T. Sims, of Sims Truck and Drayage Company; secretary, W. W. Hite.

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101 Makers Out of a Possible 200-Odd Bid On Five Classes of Army Trucks

Good Showing Made Possible by Acceptance of Bids Not Adhering to Letter of Stringent Specifications —Usual Prices Not Reduced in Bids

CHICAGO, June 11—One hundred and one out of a possible 200 manufacturers submitted bids here to-day for army trucks of Classes A and B and ½-, ¾- and 1-ton vehicles. This showing is considered especially good in view of the stringent army specifications for Class A and B trucks as published in full in THE COMMERCIAL VEHICLE for May 1, 1917. It was only made possible, however, through a last-minute decision of the Government to accept bids on trucks as at present manufactured rather than to adhere to the letter of the specifications.

Contrary to the reports published elsewhere to the effect that the prices of the great majority of the trucks offered were cut considerably, the prices were above those at which the trucks are at present sold to the private user, except in a few cases. This was no doubt due in many instances to the anticipated further rise in the cost of materials, and it would appear that many makers based their bid prices on the estimated cost of production plus a reasonable profit at the time of delivery to the Government. This was uncalled for because of the fact that information available to prospective bidders specifically stated that allowances would be made over and above the prices quoted in the bids if proof could be submitted later that the cost of materials entering into the truck construction had actually gone up.

Bids Sufficient for Present Needs

In all, bids were received for from five to 76,000 trucks, sufficient to fill the army needs under the present plans of campaign. As announced in THE COMMERCIAL VEHICLE for June 1, 1917, the bids for from one to 35,000 Class A trucks and from one to 35,000 Class B trucks were opened on June 10, and for one to 200 ½-tonners, one to 200 ¾-tonners and one to 200 1-tonners on Monday, June 11.

It was in the opening of the offerings of the 1½-ton and 3-ton trucks that the most interest was shown because these bids were called for originally on the army's standard specifications, which were drawn up with the assistance of the Standards Committee of the Society of Automotive Engineers.

The standard specifications depart to such an extent from the specifications of the manufacturers, as the trucks are built for commercial use, that few, if any, manufacturers could promise early delivery. Consequently, word was sent out from the Quartermaster's Department that bids would be received on immediate or early delivery on trucks in quantities according to the manufacturer's own specifications.

There were 83 bids on trucks in Classes A and B. These were on the two capacities and were submitted by 81 different manufacturers, most of them bidding on their own specifications, but many of them setting a figure at which they could manufacture according to government specification within from 2 to 4 months.

Few Light Truck Bidders

On the light delivery truck of ½-, ¾- and 1-ton capacity, the bidding was not so heavy. There were 33 manufacturers who offered to build the lighter vehicles, and in addition, there were four makers of truck-forming attachments who offered to submit either the attachments alone for Fords or Dodges formed into trucks, in varying quantities and from immediate delivery up to 3 months.

Anticipation of increasing prices affected many of the offers. Packard, for instance, set the date of August 10 as the time after which it would have to accept contracts at a considerable increase. Other concerns made a price on deliveries up to January 1 approximately 10 per cent lower than deliveries after that date. Other manufacturers put in a clause stating that their price was based on current material and part costs and would have to be increased in proportion as the costs increased.

Many of the manufacturers took this into consideration by offering to build a truck to government specifications at a flat rate of cost plus a per cent. Willys-Overland offered to manufacture at a cost plus 15 per cent, and most of the others made their figures cost plus 10 per cent.

Some of the concerns offered to turn over their plants wholly or in major proportion to the Government for truck manufacture. The J. C. Wilson Co., for instance, offered to turn over 75 per cent of its capacity for government production, at cost plus 10 per cent basis, and stated it could turn out 6400 trucks per year. The Denby Motor Truck Co. placed its entire production of 200 per month at the disposal of the Government on 4 months' notice.

The Four Wheel Drive Co., Clintonville, offered to license other manufacturers to use its four-drive patent on government work.

Some unusual requests were brought to light in the matter of suggestions for government control of supplies, as for instance that of Charles E. Reiss & Co., who made a proviso in their contract that the Government guarantee delivery of parts.

Some of the big offers included those of Velie, which bid on any number up to 5000; G. M. C., 1000; Nash, 5000 and 500 per month after the first year; Stegeman, 2000; J. C. Wilson, 4800; Willys-Overland, 10,000, at the rate of 500 per month on the big trucks, and 15 per day on the small ones. Studebaker is prepared to furnish 1200.

The lighter trucks were offered both with bodies and without, but there was a special call for government specification bodies for type A and type B trucks, and there were nearly 100 body manufacturers who made bids on service bodies with or without their canvas covers. The prices for these ran from $200 to $350, and were offered in large lots, such as that of the J. G. Brill Co., which said it was able to furnish 21,000 in the first year.

Plans for Awarding Contracts Not Announced

Plans of the War Department, so far as the awarding of contracts is concerned, are not announced, as yet. In fact, at the Central Depot here the instructions regarding the bids, according to Lieutenant Ecker, are to make a digest of the bids, and forward them to Washington, for disposal at headquarters. Whether the contracts will be forwarded from Washington or Chicago is not known.

Great credit must be given the Quartermaster's Department for its decision to accept bids which did not adhere to the letter of the law laid down in the stringent specifications but permitted makers to offer their standard chassis as now made. If it had not been for this wise move, it is doubtful if the department would have received more than a dozen bids, for there is no such truck made as would conform to the letter of the specifications. To make it necessary for makers to change their manufactur-

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ing equipment in order to turn out special trucks meeting the specifications in every particular would probably have caused delays of several months.

The decision to accept bids on trucks as they are now offered to commercial users will have two important advantages for the Government. In the first place, such a course will enable it to get the required trucks in time for present needs. These can be taken from stock now on hand and from vehicles now passing through the various plants and in more or less completed form at the present moment. The additional vehicles can then be taken over as socn as they are finished without disrupting the entire plant schedule.

The other important advantage which is not so readily apparent, but which should be from the well-known experience of France and England, is that the building of a special war truck model would disrupt the makers' business to the private user who is engaged in any way in the transportation of the nation's goods. From this day forth, motor trucks are a vital link in the industrial life of the nation, especially as the railroads are taxed far beyond their limit. The industrial life of the nation behind the actual fighting lines is just as important as that leading directly to the trenches.

Complete Bids on Army Trucks, Including Classes A and B and ½-, ¾- and 1-tonners

Bids on One to 35,000 Trucks

CLASS A AND CLASS B

		DELIVERIES		PRICES			
	After Order	Per Mo.	Total	1½ Ton	A Body	3-Ton	B Body
Acme		50	600	.....	.....	$3000§	.....
Armleder	60 days	75	.....	$2150†	.....	2900†	.....
Atchison		50	750	2400†	.....	2900†	.....
Atterbury		40	500	.....	.....	3500§	.....
Beck	60 days	12	.....	1950†	.....	.....	.....
Bessemer		225	.....	2325†	.....	3313§	.....
				2412*			
Bethlehem	45 days	100 up	5000	2175	$190	.....	.....
B. & M		100	3000	3100*	(With body)	.....	.....
Bourne Magnetic	August	25	450	2750†	.....	.....	.....
Brockway		.....	1492	2975*	255	3872§	$295
Burford	Immed.	100	2300	2463†	.....	3813†	.....
Clyde	30 days	1000	2600	2465†	.....	3290	.....
Consolidated	July	.....	585	2156	375	.....	.....
			600	2250*	.....	.....	.....
Corbitt		10	.....	2500†	200	.....	.....
Cunningham	January 1	50	200	.....	.....	3000	.....
Dayton	3 days	12	350	.....	.....	4000	Extra
D-E		.....	.....	1200†	.....	1687†	.....
Denby	August 1	200	1050	2425†	.....	.....	.....
Denmo	90 days	25 up	.....	2906†	.....	.....	.....
Diamond-T	Immed.	250	975	2125	.....	2965	.....
Dorris	Oct. 10	10	750	2443†	.....	.....	.....
Dart	30 days	100	.....	2975†	.....	.....	.....
Fageol		.....	100	3500*	.....	4500§	.....
Federal		.....	.....	1966†	305	2563†	336
Forschler	July	5	.....	2055	.....	.....	.....
F. W. D	July 1	120	(910 Govt. spec. in 4 mo.)			3200†	.....
F. W. D. (C. P. Reiss)		100	(Govt. to guarantee parts)			3500§	.....
Tractor Prod. Co. (F. W. D.)		.....	.....	.....	3240	.....	.....
Garford	July	100	1050	2730	255	3537	288
G. A. Schacht	August 15	25	.....	2650†	.....	3200	.....
G. M. C.	Immed.	.....	1000	2390†	.....	3140†	.....
		.....	1000	.....	.....	.....	.....
Gramm-Bernstein	July	66	750	2790*	.....	3100§	.....
Grove	October 1	.....	.....	1786†	.....	.....	.....
Henney		2	3700	.....	.....	.....	.....
Hewitt-Ludlow		4	.....	2850†	.....	3950†	.....
Hurlburt		.....	.....	2350†	.....	3900†	.....
		.....	.....	2550*	Body inc.	4250§	.....
Indiana		50	.....	2562	.....	3236	.....
Jeffery	45 days	250	5000	2465	(Quad)	Govt. spec. with exceptions	
Kelly-Springfield	January 1	280	.....	2600†	.....	3442†	.....
Kelly-Springfield	January 1	280	.....	3090*	.....	3590§	.....
Kissel	4 months	150	.....	2627*	.....	.....	.....
		75	.....	2100†	.....	.....	.....
Lippard-Stewart		70	.....	3237	250	.....	.....
				3300*	.....	.....	.....
Macrae	40 days	10	.....	2350†	.....	3400†	.....
Mack		.....	.....	.....	.....	4175§	.....
Master	5 days	100	.....	2390‡	.....	.....	.....
Modern		.....	2000	2785	.....	.....	.....
Moon		50	500	2550*	285	.....	.....
Moreland		200	550	2250†	.....	2880†	.....
Noble		.....	50	2100†	.....	.....	.....
Norwalk		.....	.....	.....	.....	2860	.....
Oneida	July 10	5	45	1855	.....	2520	.....
Packard		500	3000	3474*	Inc. body	4125§	Inc. body
Packard		.....	.....	3082	Inc. body	3536	Inc. body
Packard		.....	.....	2903	.....	3364	.....
	Note. Govt. spec. with certain exceptions						
Peterson		10	100	.....	.....	.....	.....
Pierce-Arrow	September	100-300	800	3500†	.....	4300†	.....
Pierce-Arrow	January 1	250	.....	3800*	.....	.....	.....
Pullmore		25	300	.....	.....	3000	.....
Reo	30 days	75	.....	1485†	144	.....	.....
Republic	August 10	.....	3300	2020‡	.....	2578‡	.....
Riker	Immed.	100 up		.....	.....	3871†	.....
				.....	.....	4379§	Inc. body
Rowe		.....	500	2595	Body inc.	.....	.....
Sandow	Sept. 1	20	300	.....	.....	2983	.....
Selden	30 days	100	1500	2807	.....	3716	.....
Service	60 days	100	.....	2900*	235	.....	.....
		.....	.....	2500†	.....	3000†	.....
Signal	August	.....	.....	2300†	.....	3000	.....
Standard		125	.....	Cost plus 10%			
Staver		.....	.....	.....	.....	3950§	.....
Stegeman		100	2000	2515*	.....	2945§	.....
Stewart	July	100	600	1756†	.....	.....	.....
Strand		.....	250	.....	.....	.....	.....
Sullivan		.....	150	.....	.....	$3056†	.....
Tower		.....	25	.....	.....	.....	.....
Transport		.....	8½	100	.....	4380§	.....
United	30 days	.....	25	.....	.....	2870†	.....
						3375§	
United F. W. D. T. Corp	Sept.	20 up	.....	3250 or cost plus 10%			
U. S		500	.....	.....	.....	.....	.....
Velie	30 days	100	5000	2700†	$205	3750†	$255
White	July 1	200	5725	3150†	.....	3800§	.....
Wichita		5	100	2950*	.....	3800§	.....
Wilcox, H. E.	September 29	75	.....	2200†	.....	.....	.....
Wilcox, J. C.	90 days	400	4800	2915†	.....	.....	.....
Willys-Overland		500	10,000	Cost plus 15%			
Winther	August 5	....	2500	2525†	.....	.....	.....
				2850*			
Witt-Will		.....	12	2300†	.....	.....	.....

†Bidding on makers' specifications.
*Bidding on Government Type A military truck.
§Bidding on Government Type B military truck.
‡Bidding on makers' specification, extra charge for steel wheels.

Bids on One to 200 U. S. Army Trucks.

½-TON, ¾-TON AND 1-TON SIZES.

		DELIVERIES	PRICES			
Name	Begin	Per Mo.	½-Ton	¾-Ton	1-Ton	Remarks
Abbott & Downing		5	.....	$1700.00	.....	
Beck	60 da.	12	.....	.....	$1080.00	Total 150
Bethlehem	10 da.	.....	.....	.....	1095.00	
Brinton		25	.....	1125.00	.....	Chassis only
Collier	4 mo.	50	$900.00	.....	.....	After Jan. 1, $1000
Commerce	7-1	60	.....	1240.00	.....	
Commerce	Bidding on 100, no price					
C. V. Motors	2 da.	.....	745.00	.....	1190.00	
Denmo	Immed.	Model 10 chassis,		1289.00	Body, 225.00	
		Model 12 chassis,		860.00	Body, 150.00	
Economy	30 da.	25	708.75	.....	.....	
Federal		50	.....	1485.00	.....	Or, cost plus 10%
Forschler	7-19	4	.....	1625.00	1825.00	
Garford	3 wks.	100	.....	1657.50	1855.00	
Henney	10 da.	3	.....	.....	1440.00	Price change after first 3 mos.
I. H. C	10 da.	80	.....	1160.00	.....	Body extra
Jeffery	30 da.	200	.....	.....	1232.50	
Koehler	Immed.	20	.....	.....	1075.00	
Lippard-Stewart	2 wks.	.....	1140.00	1740.00	2250.00	Worm drive, price with body
Mackbilt	30 da.	40	.....	.....	895.00	
Martin	Immed.	10 up	.....	900.00	.....	Body extra, total 400
Maxwell		.....	.....	.....	795.00	
Norwalk	30 da.	75	.....	1135.00	.....	
Packard		.....	.....	.....	1860.00	After 8-10, $2232
Rainier		.....	875.00	1020.00	1875.00	Chassis only, body extra
Reo	30 da.	200	.....	946.00	.....	Complete
Republic		.....	.....	.....	1350.00	
Rush	30 da.	50	750	.....	.....	Body extra
Selden		25	.....	.....	1810.80	
Seneca		75	.....	643.00	.....	
Studebaker		.....	663.75	.....	900.00	
Superior	10 da.	20	.....	.....	1250.00	
Vim	June 20	.....	875.00	.....	.....	Price according to body and model.
Willys-Overland	24 hrs.	1375	722.50	.....	.....	

Bids on Passenger Car Converters

Illinois	Immediate delivery, 15 per mo.	Fords, with attachment	$660.00
		Dodges, with attachment	1050.00
Smith	24 hrs. 100 to 200 per da.	Ford, ½ ton	627.46
		Ford, ¾-ton	627.46
	Car with attachment	Dodge, ¾-ton	1102.56
		Dodge, 1-ton	1102.50
Hudford		Attachment for Ford	397.50
	With body	Attachment with Ford	835.00
Maxfer	Delivery 30 da	Ford, with attachment	784.30
	Delivery, 30 da. 200 per mo.	Dodge, with attachment	1246.60

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Motor Trucking Centers of America—VII

WASHINGTON

City of Good Pavements, Few Grades and No Manufacturing—Trucks Haul Necessities of Life

WASHINGTON, D. C., June 9—Almost as flat as the proverbial billiard table, Washington, D. C., has long been known as one of the few cities in which trucks have lives longer than the average. This is due principally to the exceptionally good streets and the absence of grades on which excessive speeds have not some detrimental effect as in cities where the streets are paved with cobblestones and kept in poor condition.

Under the commission form of government in which the building of the streets and the maintenance of the surfaces are under the direction of the United States Corps of Engineers, the capital city has always kept its streets in good repair. Good streets, no grades and average carefulness on the driver's part mean the elimination of a great deal of the vibration and wear and tear which in other cities tend to reduce the life of business vehicles.

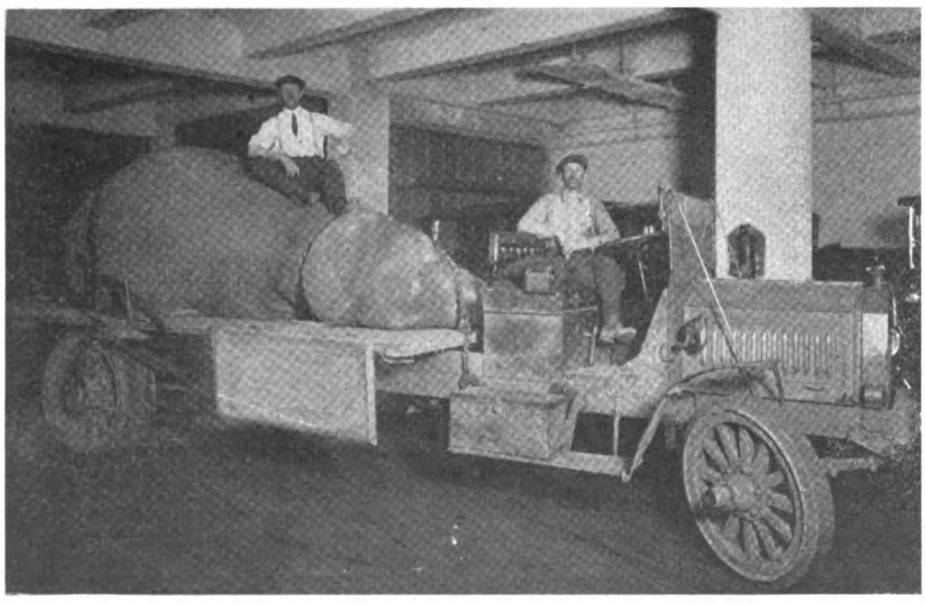
Washington Has Excellent Streets

Unusual in the excellent condition of its streets, Washington is also unusual in the fact that there are no manufacturing plants within the city limits. For this reason most of the trucks used are employed in handling the necessities of life, such as food of all kinds, clothing, coal, ice, etc., and materials used in the construction of buildings of all kinds. Many trucks are also in service as buses due to the large number of visitors who come to the capital for various reasons, both business and pleasure, and must always visit all of the important government buildings before they leave.

It is estimated that there are between 1000 and 1500 trucks of all sizes and capacities now at work in the city. Many Fords are used as commercial vehicles, and even some small number of Fords turned into trucks by means of one of the various makes of adapters now on the market are included in this estimate.

Heretofore Washington has been a city in which trucks of small capacity, that is, under 3 tons, were principally used. This has been due mainly to the lack of manufacturing plants which would require day-in-and-day-out hauling in which trucks of 3 to 6 tons capacity could be used with full loads practically all of the time. Although this condition will probably exist in Washington due to the absence of manufacturing establishments by federal laws, the use of larger trucks has increased tremendously during the past year, and it is estimated by some that this increase in 3-ton trucks and over has been more than 200 per cent. Many of these vehicles have been purchased by building supply houses which furnish the construction materials for the erection of governmental and private structures.

Since the declaration of war, Washington has been filled with a veritable army of outsiders who are in some way connected with the carrying on of preparations for war, and many new buildings have been rushed to completion since that time in order to house them. The tie-up of the railroad facilities along the Atlantic coast has had its effect on Washington as well as the other large cities, and this in turn has increased the use of trucks in overland hauls from points outside of Washington into the city itself. These trucks generally run on schedule time, carrying produce and the like, where loads of over 2 tons can be handled day in and day out. Such trucks can make especially good time because of the excellent condition of the roads in the surrounding territory. Some trucks of over 2 tons capacity are also used in the express service between Washington and Baltimore, and since the railroad congestion the work which these trucks do has increased many times and has resulted in the addition of many trucks to the fleets of the concerns handling such work.



An unusual load—Dunk, an old circus elephant which had been at the Washington Zoo for 25 years, died at the tender age of 55, and had to be taken 4 miles down the Potomac River to the taxidermist. A Packard 3-tonner was used for the job

An Overland Haul of 105 Miles

One unusual example of this overland haulage work is that of a 2-ton Autocar used to carry moving-picture films between Washington and Baltimore, a round trip of 105 miles. This truck is used to collect the films shown in one city after the completion of the show at 11 p. m. that night and carry them to the other so that they can be exhibited on the following day's program. In this work, the truck showed up especially well due to the great saving in time, which was of prime importance. Another example is that of Fraley & Fraley Co., Gaithersburg, which collects milk within a radius of 30 miles of Washington and delivers it by truck every morning rather than ship it on the railroads. Most of the overland work outside of Washington has been done to the north, over Maryland roads, which are fairly good, while the Virginia roads to the south are generally in poor condition.

Ideal Electric City

Washington has always been considered an ideal electric truck town due to its level streets and good pavements. Both of these conditions are especially favorable to the electric because of the elimination of the necessity of charging the batteries as often as is required in towns where many hills have to be negotiated, thereby cutting down the mileage capacity. It is estimated that there are more than 250 electric trucks now in Washington. The largest users of these are the express companies, including the Adams Express Co., which has a fleet of over forty, and the American Express Co., which likewise employs a large fleet.

In fact Washington was developed as an electric truck city before the gasoline truck assumed its present proportions there. Gasoline trucks are increasing rapidly and the recent purchases have been almost equally divided between the smaller and larger types. Washington business houses are fast realizing the advantages and importance of the fast-

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moving motor vehicle in the transportation and delivery of their products.

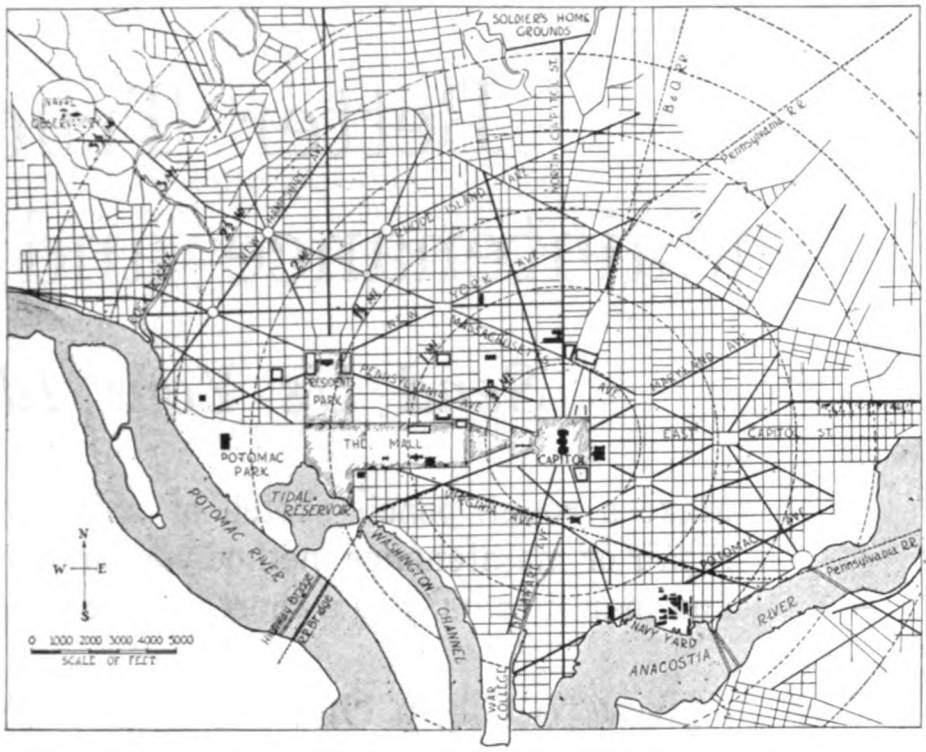
Horses are becoming more costly and more expensive to maintain and due to their slow speed are being far outdistanced by motor trucks wherever the work to be done remains nearly constant throughout the year. This offers an opportunity for the increased use of demountable or dual-purpose bodies which would enable the truck to be transferred from one class of work to another with facility. In the past, Washington has been a city of activity during about 5 months of the year when Congress was in session and a city of greatly-lessened work in the other 7 months when Congress was dismissed and the many social affairs transferred to other parts. All this has now been changed through the entrance of the United States into the war and the largely-increased population of the city will undoubtedly result in the purchase of a large number of motor trucks because of the demands of the visitors for quick and efficient service.

Many Horses Still Used

There are now more than 1,000 horses in use in the city for business purposes, and many of these will undoubtedly be replaced by trucks of large or small capacity according to the work to be done. Although this year is somewhat of an exception due to the late summer, Washington has always been hard on horses during the summer months due to the extreme southern heat, so that the motor vehicle has a decided advantage in that respect.

Still another unusual feature for which Washington was noted was the manner in which it issued perpetual licenses for $2 per vehicle. In addition to this tax, a property tax of $1.50 for every $100 of assessed value was also charged. This old-time law will be discontinued on January 1, 1918, according to present plans, when a new basis of taxation determined by the horsepower of the vehicle engine will go into effect. The new fee will range from $5 for vehicles like Fords up to $15 per year for trucks of over 40 hp. The increase in taxes will not seriously affect the use of trucks in Washington because the fees are nominal.

As shown on the map on this page, the main business and residential section of Washington is included with



Map of Washington, showing the layout of the Capital City. The concentric circles are drawn about the capitol as a center and are spaced ½ mile apart. Note that the main business section of the city is included within the 2½-mile circle

in a 3½-mile radius drawn about the capitol as a center. This means mostly short hauls, in which there might be a good opportunity for some form of co-operative delivery which would eliminate the waste incident to having the vehicles of two or more competitive concerns deliver to their customers on the same street with only half loads where one vehicle could handle the same work at almost one-half the cost. From a report of the Census Bureau quoted in part in the May 15, 1917, issue of THE COMMERCIAL VEHICLE, data collected from 128 retail concerns in Washington showed that 6.2 of the gross sales was spent for retail delivery. The cost for groceries was 4.4 per cent; for milk 12.1; for bakery products 19.8; for ice cream 14.9; for ice 45.6; for coal and wood 15.2 and for laundry 20.3.

The accompanying table shows the great predominance of sheet asphalt and coal tar street surfaces in the city, which are almost 33 1-3 per cent of the total mileage of improved and unimproved streets. In all, Washington has a total of 7,097,446 sq. yd. of paved streets. This total reduced to miles gives 513.69. In detail, the various classes of pavement areas are as follows:

Sheet asphalt and coal tar	159.42
Asphalt block	30.59
Asphalt on concrete bases	4.58
Asphalt on broken-stone bases	2.68
Cement concrete	3.75
Granite block and rubble	23.93
Vitrified block	1.34
Cobble	3.31
Macadam	122.78
Gravel and unimproved	161.31
Total	513.69



Dunk weighed 12,000 pounds and it was quite a problem, first, to get him out of the zoo and second to get him onto the truck. Above he is shown being dragged out of the zoo by means of a heavy chain around his neck. He was later dragged up on the truck through the use of skids and rollers. After passing through the hands of the taxidermist Dunk will be shown at the National Museum. He was a famous circus elephant, but had outlived his usefulness because of his very bad temper

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Better Truck Maintenance and Repair

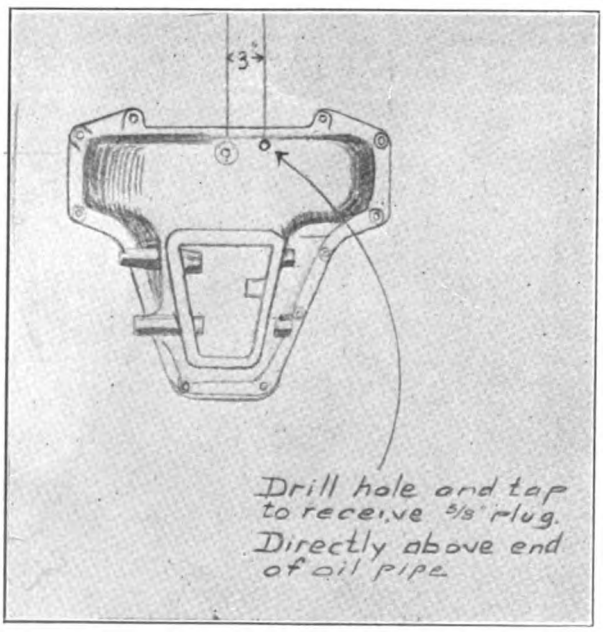
Send Us Your Ideas

Make a rough pencil sketch of some good motor truck repair or maintenance method you have made or employed and mail it to us with a short letter telling how you did it

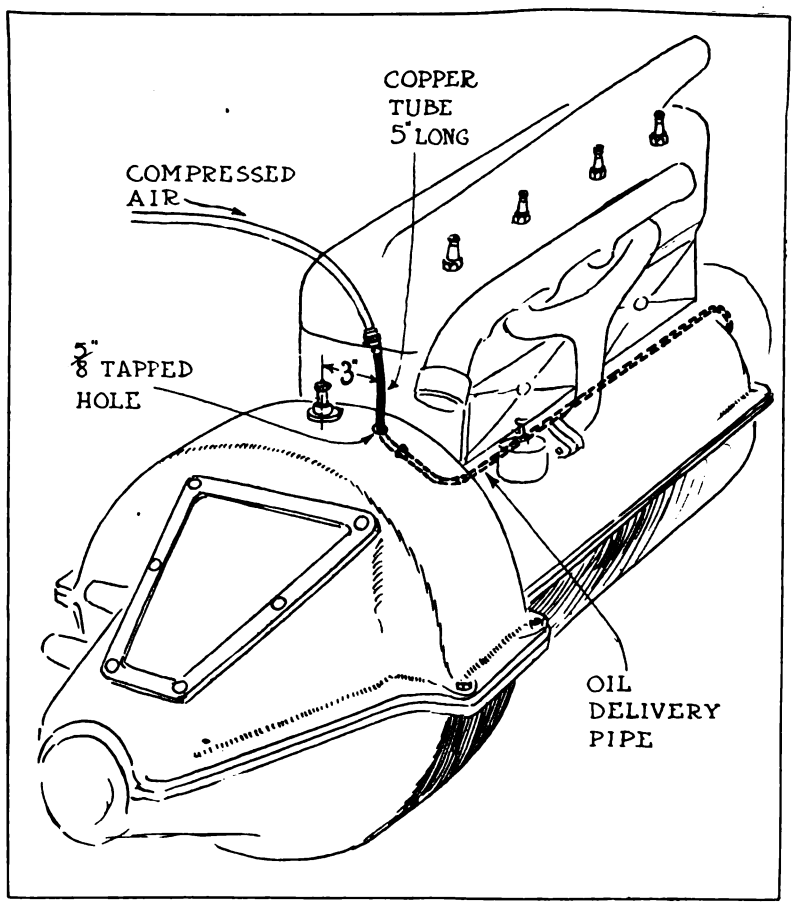
How to Clean Out a Clogged Ford Oil Line

OCCASIONALLY dirt or some foreign substance will clog up the oil line on the Ford engine. This becomes very serious if the vehicle happens to be any distance from a garage, as it is necessary to remove the gearset housing cover to dislodge the clogging material. Due to the very large number of Fords used as commercial vehicles either as plain Fords or as adapted trucks by means of one of the various makes of attachments now offered on the market, the following solution of the problem by I. J. Eshliman, Los Angeles, Cal., should be a money-saver to Ford users:

"Drill a hole in the transmission cover directly above the



The sketch Eshliman sent to THE COMMERCIAL VEHICLE



Eshliman's idea as shown in a perspective sketch to give the method more clearly

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end of the oil pipe and then tap and fit it into a ⅝-in. plug. Carry a 5-in. length of copper or brass tubing in the tool-box on the vehicle and when trouble with the oil system develops remove the plug and insert the end of the tube into the end of the oil pipe. The substance can then be cleaned out easily by attaching the foot pump or compressed-air line to the tube and blowing it out. This course may save several dollars in repairs or time lost or perhaps the price of a new engine."

How to Make a Fan-belt Lacing That Will Last

LACING a fan belt is a simple operation, yet one in which a neat and satisfactory job cannot be done unless care is taken in performing the work. According to T. C. Price, New York City, the best method of lacing a fan belt is as shown in the illustrations below. The various steps to be taken are as follows:

1—Make holes with belt punch.

2—Don't make the holes so big as to weaken the belt.

3—Three holes are usually sufficient on each end of a fan belt.

4—If the lacing is too wide, slice it off as shown, using the thumb to guide the knife while holding the uncut lacing against the edge of a bench or the like.

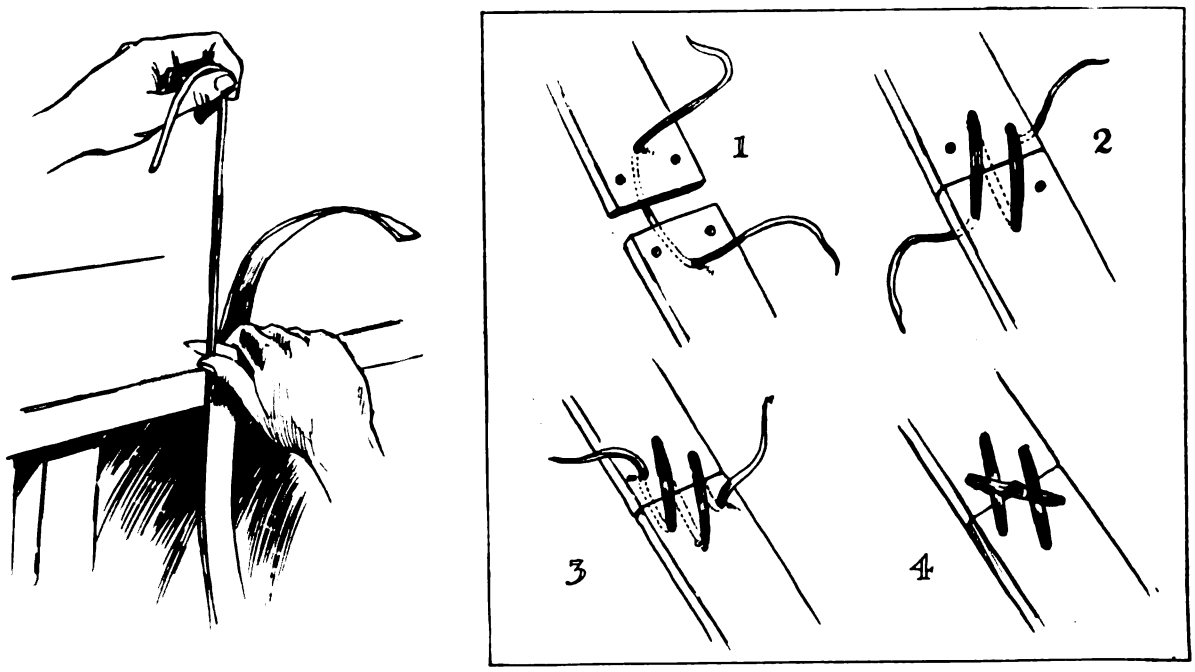
5—After the lacing has been cut to the desired width, about ½ in., stick one end through one of the center holes from the bottom of the belt as shown in No. 1. Do similarly with the other end.

6—Pull taut and then stick the ends through two of the other holes from the top as shown in No. 2.

7—Pull taut and then stick the free ends through the third holes in each end as shown in No. 3.

8—The final operation is to tie the lacing on the top of the belt and then cut off the surplus material as shown in No. 4.

9—If this method is pursued the three lengths of lacing on the bottom of the belt where it passes around the pulley will be parallel and there will be no tendency for the belt to run off or come loose.



How to lace a fan belt properly. At the left is shown a good way to use the thumb in guiding the knife to cut the lacing evenly. At the right are the four main steps to take.

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Army Motor Truck Specifications *from the* Owner's Angle

Truck Manufacturers Agree With THE COMMERCIAL VEHICLE *That Army Trucks Will Be Costly to Build, Costly to Operate and Need Not of Necessity Be Best for Average Needs*

ALMOST without exception, motor truck manufacturers throughout the United States have expressed their agreement with the editorial published in the May 1, 1917, issue of THE COMMERCIAL VEHICLE, which is reproduced on this page. It is not intended that this editorial be construed as indicating a lack of patriotism. It is written for the truck owner, the firm or individual who must depend upon efficient motor truck transportation. What it points out should save money for the average truck user. The views of some of the prominent truck makers follow:



Truck Specifications from the Owner's Angle

OWNERS of motor trucks in commercial service should realize that a truck built according to the specifications of the United States Army trucks published in this issue need not of necessity be a vehicle best suited to their needs. As users of motor trucks, let us not lose our heads in this time of national crisis and demand trucks patterned after what the military authorities believe is the best type of vehicle.

These army specifications are admittedly based, at least in part, on our experience in Mexico, where, due to the almost entire absence of roads, it was a crime to run any kind of motor truck. Commercial users of trucks throughout the United States have learned that they cannot make money running trucks over roadless country. Europe very soon learned the lesson that motor trucks need roads. Both France and Italy soon found that it was far cheaper to build good roads than to bring out new models of super trucks. Since the beginning of the war, Italy has had a force of 20,000 men continually engaged in building new roads. Similarly, the transportation of ammunition and men required for the successful defense of Verdun by the French was accomplished over a road especially built for truck use.

So it is with America. We need better roads rather than stronger trucks. Let us demand that we have real motor truck roads instead of new models of trucks patterned after army specifications.

While it is safe to assume that some good to the commercial user will come out of the new army truck specifications, it is certain that trucks built along the lines laid down will have many attributes not necessary for ordinary commercial usage. It is also certain that trucks built to these specifications will be expensive—that cost will be a second consideration—and to what end, merely to have reserve strength and power for extreme conditions under which experience has taught us the use of the truck is not economical?

It is doubtful whether the larger radiators and the more powerful engines required in the army specifications are needed in commercial service and whether having them would not decrease the vehicle efficiency under ordinary conditions, besides increasing the price out of proportion to the benefits accruing. It is also doubtful whether the ban against single ignition and unit power plant assembly does not increase the price of a truck out of proportion to the cost for everyday service over fair roads.

The requirements on brakes are perhaps too severe for usual truck service, yet there is no doubt that brakes on many of our trucks could be larger and of a more efficient self-cooling type. Four-speed gearsets offer a great range of speed, although the minimum low gear ratio of 40 to 1 is very much lower than is commonly desirable on trucks in everyday work. Stronger and better-designed steering pivots and steering gear are necessities.

Metal wheels, with their greater shape-holding characteristics, undoubtedly provide an advantage over the wood type, although it is not quite plain why metal instead of cast steel wheels should not have been specified.

It is striking that the limitations placed upon the carbureter are less stringent than those found in commerce, but possibly the government will demand and secure a better grade of gasoline than can be obtained by the average small user.

The requirement that the tread or gage of the trucks shall only vary from 58½ to 64½ in. is a step in the right direction and one which should prove of as much value to the truck in commerce as in war work.

A standardized tread, while it might impair the usefulness of the smaller trucks, would be good for motors as a whole, because it would obviate the necessity of each different size or make having to break down a new track in those poor roadways which trucks must use until better thoroughfares can be built.

The specifications contain many details, such as easily-removable engine shields; means to drain a flooding carbureter without having any of the fuel drip into the engine pan; suitable bumpers and efficient radiator guards, all of which should prove of equal value to the ordinary user and to the army. If proven of practical value, truck manufacturers will automatically include such design in their stock models. But in the meantime let us focus our aims in a demand for more and better types of roads really suitable for truck use every day of the year so that the trucks we now have can be operated with less repairs due to poor roads and at higher rates of speed than are now possible on such highways.

Strict Specifications Mean Delay

"In regard to your editorial of May 1, would say that we appreciate the necessity of standardization of motor truck equipment in military use; however, such a step as this takes many years to accomplish.

"Consulting engineers, etc., usually dwell upon the theoretical advantages of standardization, oblivious of the fact that the military need is such that we cannot wait for new ideas to be perfected and carried into operation.

"When the Canadian Government became involved in the purchase of motor trucks, it obtained the consulting engineers' advice, with a result that trucks of an entirely unknown design to anything made in the United States of America, or Canada, were recommended as being the most suitable. The result was a lot of lost time and needless expense, and we hope that we will not see this experience repeated in our own country."—H. W. ACASON, president, Acason Motor Truck Co., Detroit.

War Trucks Costly

"The truck that is built for war purposes is practically worthless to the average business man. The cost of fuel, upkeep, and other parts will prove too much for the business man. In your editorial you have stated the facts more clearly than I could and I heartily approve of the manner in which you have brought these before both truck users and makers. Patriotism is good practical common sense."—BRAZIL MOTORS Co., Brazil, Ind.

Owners Won't Want Work Trucks

"We do not anticipate any rash action on the part of the public in demanding motor trucks built along specifications that have been determined by those who had this matter in charge and approved by the Government.

"We believe that a good salesman can show prospective motor truck users wherein it would not be to their advantage to even consider the purchase of motor trucks constructed along the lines laid down by those who have worked out specifications for Government trucks for private use, as the nature of the work that the trucks are put to while in Government service is entirely different to the average commercial work."—C. W. STEELE, secretary, O. Armleder Co., Cincinnati, Ohio.

Atterbury in Accord

"In reference to your editorial in the May 1 issue, I think it is a very interesting article and we are in hearty accord with the opinions as expressed in it."—J. R. SPRAKER, general manager, Atterbury Motor Car Co., Buffalo, N. Y.

Conditions Rightly Put

"We want to compliment you on your editorial. The writer is strongly of the opinion that the manufacturers are leaning too much toward the United States and foreign war business and allowing specifications to creep in which change the design of their trucks and in some cases the operating results.

"You are exactly right when you say to meet conditions such as exist on the Mexican border does not always lead to the best results for ordinary commercial use.

"We want to compliment you on the editorial and think if some of the manufacturers would pay attention to it and profit by it, it would lead to their betterment."—J. P. MCCUNE, Blair Motor Truck Co., Newark, Ohio.

Short But Sweet

"Your editorial is certainly a good one. I wish to congratulate you on it."—I. M. LEWIS, treasurer and manager, Bessemer Motor Truck Co., Grove City, Pa.

Trucks Must Help Railroads

"We must commend you on the common-sense attitude

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you have taken with reference to army truck specifications as applied to commercial use. You are touching the vital spot when you suggest the advisability of better road conditions instead of the necessity of building a supertruck to meet improper road conditions. The day is now here when a vast amount of local freight hauls must be taken over by the motor truck, and to properly take care of this service calls for improved road conditions. There was a time when it was thought that waterways would relieve the pressure on the transportation lines, but to-day it is roadways which must and will relieve this pressure.

"It will be the policy of this company to take care of commercial business so far as possible and consistent with the patriotic spirit instead of attempting to secure an abnormal amount of war business. This policy is adopted with the thought in mind that trucks placed in commercial service tend to relieve railway pressure and improve transportation conditions to the interests of the Government. There is to be considered the vast movement of commodities to the transportation lines which are to handle them on behalf of the Government and this first movement of these products is in a large measure work for the motor truck.

"To attempt at this particular time to make radical changes in motor truck construction would vastly interfere with the present efficiency in production, and this at a time when the highest efficiency in all lines of American manufacture is required." —C. J. HELM, sales manager, Cadillac Auto Truck Co., Cadillac, Mich.

Good for All Work

"We can say, after considerable observation of both European and American makes in service under both commercial and military conditions, that in our opinion vehicles constructed under the new U. S. Army specifications would meet admirably the work which they will be called upon to do and that the specifications themselves lay out a vehicle which we would consider excellent for both military and commercial work."—J. B. CROCKETT, The Clyde Cars Co., Clyde, Ohio.

Subscribes to Every Word

"Permit us to subscribe to every word of your excellent editorial.

"The writer, after many interviews with departmental officials at Washington on this subject, is in a position to state that they all agree that the basic aim in deciding upon these specifications was not criticism of present design as it applies to the duties of business conditions but rather adequate provision for factors of safety, wide margins of power, gear ratio, radiation, etc., to be provided for in future campaigns under similar possible conditions to those that confronted motorized military transport in the Mexican campaign. The large majority of officers are hoping that the specifications adopted will influence manufacturers to develop this type purely for military purposes.

"The real danger lies in the temptation to those manufacturers who are awarded Government contracts to use this as an advertising lever to influence the purchase of trucks of similar specifications of their make by prospective business concerns. If this is done, increased first cost and additional cost of operation are sure to follow.

"Manufacturers should cooperate with papers like THE COMMERCIAL VEHICLE in making this point perfectly clear to both the dealer and prospective purchaser, as misconception on this point on the part of the public is most natural on the basis of, 'What has proven good for the Army must be good for me, in Motor Trucks.'

"I trust that all manufacturers may view this matter in a similar light to the end that the public may not be misled and real injury result to both themselves and the industry."—GEO. D. WILCOX, sales manager, Commerce Motor Car Co., Detroit.

Correct in All Conclusions

"The editorial 'Truck Specifications from the Owner's Angle,' is timely and is entirely right in all its conclusions. It is correct in its facts and in its advice to truck users and to the general public which is benefited by improved roads and motorized transport. — R. E. CARSWELL, general manager, Dispatch Motor Car Co., Minneapolis, Minn.

Struck Right Note

"You have struck the right note. At the present time a great deal can be done toward developing motor truck specifications for commercial use rather than military purposes. It is interesting to note that many of the recent foreign orders are for standard-type trucks rather than the special-construction trucks which were ordered at the beginning of the European War."—R. W. WALKER, general sales manager, Hurlburt Motor Truck Co., New York City.

Suggestions Very Timely

"We are very much in sympathy with the editorial in the May 1 issue of THE COMMERCIAL VEHICLE. We agree with you thoroughly that a truck that might be entirely suitable for the Government would not be suitable for the average user.

"I think your suggestion in this article is very timely and I believe truck manufacturers will do well to profit by it, although, of course, the Government needs must be supplied." — C. G. BARLEY, president, Indiana Truck Corp., Marion, Ind.

Agrees in All Conclusions

"We certainly agree with your conclusions in practically every instance. While we feel that a truck built according to these specifications would undoubtedly do some remarkable work, we believe that the work would be classified as a 'stunt' and not as a regular performance that a truck is expected to give."—H. P. MANLY, secretary, Manly Motor Corp., Chicago.

Hit the Keynote

"We have read with interest your editorial in the May 1 issue of THE COMMERCIAL VEHICLE and believe that you have hit the right keynote regarding the truck market in view of the present war situation. We are taking the liberty of forwarding copies of this to 3000 Maxwell dealers, which is the best way we know of spreading the doctrine."—T. J. TONER, director of sales, Maxwell Motor Sales Corp., Detroit.

War Trucks Costly

"The specifications as a whole are very good, but the cost of a truck built to these specifications will be higher than a truck built for commercial purpose. The average truck used by merchants will never be put to such a severe test as a truck that is made to be used by the U. S. Army. There is no question but what a truck to be successful in commercial business must be operated on fairly good roads."—GEO. H. SCHELP, secretary and treasurer, Jos. W. Moon Buggy Co.

Far West Thinks Differently

"I must say that I am not in sympathy with the general tone of the editorial. These army specifications are the result of the experience of the army officers on the Mexican border, and if complied with, would mean a tremendous advance in the standing of the motor truck in the west, where our road conditions are severe, in addition to mountain grades and desert roads. We must build trucks to meet the conditions as they exist now—not what they will be when the United States is covered with a chain of good roads.

"It is my opinion that the majority of motor trucks manufactured in the United States are not properly powered or geared. In order to carry the load, the engines are worked entirely beyond their limit. It is nothing uncommon to wear out an engine in 1 year. Motor trucks should be engineered and constructed so that they will give several years' use. Many users of motor trucks are disgusted at the high repair cost of motor truck machinery, compared to other machinery which they operate. Why shouldn't motor trucks be designed and constructed to last 10 years? This can only be done by having the proper factor of safety in all parts—not to the end that we have reserve strength to meet extreme conditions, but rather that we have the proper strength to prevent the overworking of the truck.

"If you will permit me to say so, I believe that this entire editorial is written, not from the user's angle, but rather from the manufacturer's angle, who is desirous of constructing a truck to be sold at the lowest possible price, and who does not take into consideration conditions which must be met. I agree with you that if the roads were perfect, this strong construction would not be necessary, but as previously stated, roads are not perfect, and they will not be during our life time."—WATT L. MORELAND, general manager, Moreland Motor Truck Co., Los Angeles, Cal.

Army Truck No Guide

"We, of course, must hold ourselves ready at all times to co-operate to the greatest extent with the Government in the present crisis.

"We certainly agree with you that the army truck should not be a guide to commercial purchasers, as primarily it was designed for certain specific service regardless of expense, and to the commercial user with his much less rigorous conditions, expense is an all important item."—C. L. GUYMAN, assistant manager truck sales department, Packard Motor Car Co., Detroit.

Army Requirements Unusual

"This company is of the firm opinion that we cannot afford to neglect our established dealers for the sake of Government business, unless the entire plant should be taken over for Government production.

"We also agree with you

(*Continued on page* 23)

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What the British transport system was put to in the recent advance through the evacuated territory around Peronne. A convoy of Peerless trucks is shown halted for the noonday meal of the drivers

Wanton German Destruction in France Makes Allied Transport Conditions Abnormal

Obliteration of Roads by Mines, Felled Trees, Wrecked Houses, All Help to Block British and French Advance

TRANSPORT conditions have been more difficult than at any period in the history of the war since the German armies retreated from the Somme and the Aisne and the Allied forces followed them over the wrecked and desolated country. The effect of the advance has been felt in an immediate call from the British army for more mechanical transport officers to control the additional convoys put into the field. This call happened to coincide with a decision of the war department to transfer some of the younger men from the mechanical transport to combative branches of the service.

Destruction Characteristically Thorough

The obvious intention of the German general staff is to wreck the country so thoroughly that the failure of the transport services will prevent the Allied armies following up the Imperial troops. The work of destruction has been carried out with characteristic German thoroughness. Trees have been felled across the roads, mines have been exploded under them, particularly at cross roads, and houses have been brought down wherever they would form an obstruction. Also the land at each side of the destroyed roads has been plowed up to such a depth that it is difficult for vehicles of any kind to pass.

Notwithstanding all the obstacles placed in its way, the motor transport service has made it possible for the English and French armies to follow up the enemy. At the earliest possible moment large numbers of soldiers were sent out to clear away obstacles, fill up shell holes and make conditions possible for convoys to pass. In the European sense of the word there are no longer any roads, but by a determination which is only rendered more firm by the sight of the wanton destruction, the mechanical transport men keep going and succeed in supplying the infantry and artillery with the food and ammunition necessary to carry on their pursuit.



French officers' motors halted at the entrance to the recaptured town of Roye until the cluttered streets can be cleared of débris

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The greatest indignation is aroused by the sight of the destruction wrought without any military necessity. Two examples of the needless destruction of private property are shown in the illustrations on these two pages. In much of the reconquered country trees, hedges and other landmarks are so obliterated that the French authorities have decided to put motor plows on the land and prepare it for crops without any thought as to its original divisions and ownership. Not a scrap of metal remains in the entire district. Even public statues have been taken down and shipped to Germany. In one village near Nesles, now held by the French, the Germans removed every piece of metal out of a factory, then took the owner prisoner on the pretext that he had hidden some copper. His daughter, who remained behind, received three offers of marriage from the German soldiers.

Germans Feel Rubber Shortage

From information given by the inhabitants in the released districts, it is evident that the German armies are very seriously feeling the shortage of gasoline and rubber. When a certain number of trucks were sent out with a load and had to return empty, it was usual to make one of the trucks tow three others on the return trip, thus saving a certain amount of fuel. Very few German trucks are now fitted with rubber tires, the great majority running on steel bandages. It has been discovered that large numbers of passenger cars formerly employed by officers in various branches of the service have been laid up because it was not possible to obtain tires.



Entrance to the town of Peronne. The sign on the building in the foreground, reading: "Don't get angry, only wonder" (a free translation), admirably expresses the ruthless abandon with which the Teutonic hordes destroy everything in their path

Army Motor Truck Specifications From the Owner's Angle

(*Continued from page* 21)

that trucks built for the Government are not necessarily best suited for daily commercial service, and while we do not look for the public to demand trucks of similar construction to those to be built for the Government, there is no doubt but that the Government specifications will have an effect on the opinion of prospective purchasers, especially those of a technical turn of mind."—E. T. HERBIG, advertising manager, Service Motor Truck Co., Wabash, Ind.

Will Have Good Effect

"Our frank opinion of your editorial is that it will do a lot of good on account of its sensible argument against the adoption of army specifications for motor trucks.

"A truck user would not require a wire-cutting device on his commercial truck because he would have no occasion to use it. Then why demand all the other army features in a motor truck when there is really no need for them?"—F. W. APEL, assistant sales manager, Stegeman Motor Car Co., Milwaukee, Wis.

Contains Common Sense

"I have read the editorial in your issue of May 1 and think that it is very well written and contains a great deal of sound common sense."—L. E. MILLER, advertising and assistant sales manager, Sterling Motor Truck Co., Milwaukee, Wis.

In Thorough Accord

"You have certainly hit the nail on the head. We agree with you thoroughly. If our present and future business depended entirely upon the Government orders, then, of course, we would build them for that service, but as the big end of the commercial vehicle business is for business men who cannot afford to buy trucks unless they are a paying proposition to them, we have decided to build them for commercial use. Our attitude is to do everything within our power to help win the war."—T. R. LIPPARD, manager, Stewart Motor Corp., Buffalo, N. Y.

Agrees, Only More So

"I agree absolutely with your viewpoint of the United States Army truck specifications, only more so. The truck built according to the specifications of the United States Army in my opinion would not be a satisfactory truck to sell to the general trade. What we want to sell to the trade is what is for the users' best interests, and it is not to his best interests to buy a truck that might be successful under unusual conditions and would be too heavy and too complicated for the average needs. There are undoubtedly many things in the Government specifications that we will eventually adopt but I do not believe that truck manufacturers will ever build trucks conforming to Government specifications for general use."—MILO D. HERRON, secretary, Thomas Auto Truck Co., Inc., New York.

Specifications Good

"I think the Government specifications, taken as a whole, are very good. I think, however, that the unit-powerplant type of truck is superior to the separate-unit type.

"I also believe that there should be but one track, for trucks for army service, up to 3 tons capacity, and that should not be over 57 in. wide."—H. P. WOODWORTH, general manager, Union Motor Truck Co., Bay City, Mich.

Doing Genuine Service

"It would seem to me that you are rendering both the truck manufacturer and the truck operator a real and genuine service in placing this matter before them in this light."—E. S. LEE, JR., United States Motor Truck Co., Cincinnati, Ohio.

Will Follow Specifications

"The average manufacturer of motor trucks to-day will make a far greater mistake by failing to adhere to Government specifications than by complying with them—in fact, our experience on the Mexican border convinced us beyond a doubt that the Government specifications of April, 1917, are the first real Government requirements we have ever seen, and we intend to pay some attention to their requirements, regardless of your warning."—W. D. RIGHTMIRE, director of sales, Winther Motor Truck Co., Kenosha, Wis.

Hits Nail on Head

"It really seems that your editorial hits the nail on the head."—L. E. BURRELL, sales manager, Watson Wagon Co., Canastota, N. Y.

Contains Good Advice

"We believe your editorial contains a great deal of good advice."—L. J. WHITE, sales manager, Wichita Falls Motor Co., Wichita Falls, Tex.

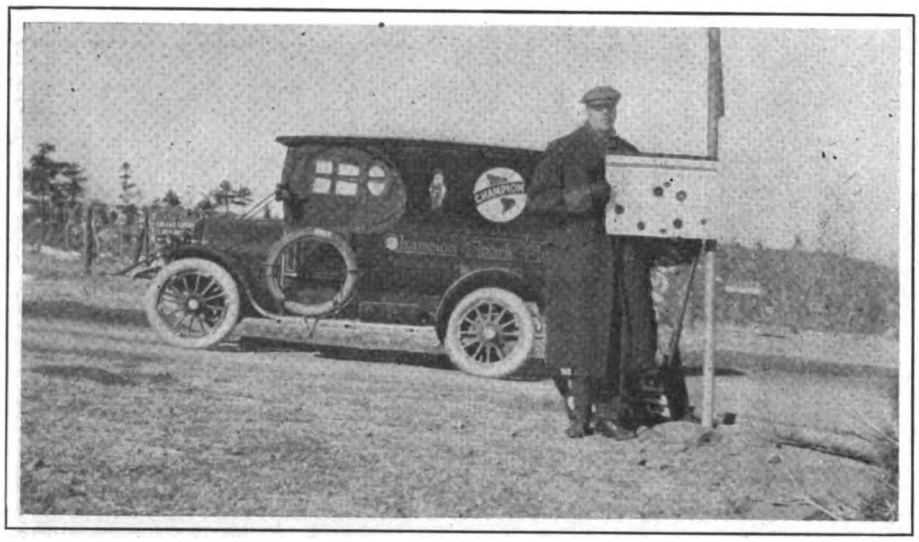
Benefit to Whole Industry

"We feel that the stand you have taken is for the best benefit of the industry as a whole."—G. J. DWYER, advertising department, Willys-Overland Co., Toledo, Ohio.

Editorial Comprehensive

"The editorial in your issue of May 1 is certainly very comprehensive and interesting."—H. J. FLINT, general sales manager, J. C. Wilson Co., Detroit.

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On the boundary line between the States of Arizona and New Mexico at the summit of Raton Pass, where the bad men practice gun shooting on the road signs as shown

Two Overlands Ramble Overland from Toledo to Los Angeles

Carry Champion Co.'s Advertising Material

By John Grant

THE motor truck is repaying its debt to advertising, which introduced it to business. Advertising has long featured the main selling point of the motor truck —its ability to develop concealed assets and dormant possibilities in the industries adopting it. As soon as the motor truck is applied in any industry, seller and buyer become energized to new opportunities. A gain for the industry is made at once in expansion of its field and in the closing up of gaps and elimination of weak connections so that more cohesive operating plans are possible.

In producing these two latter results, the effect of introducing motor truck operation on an efficient scale is similar to the effect produced by advertising which is well conceived and intelligently executed. Perhaps it is only natural that the sales department of the Champion Spark Plug Co., Toledo, Ohio, which is at once a large advertiser and thoroughly experienced in the motor industry, should have seen a way to intensify its advertising campaign by linking up the similar characteristics of these two powerful forces. However that may be, the California correspondent of THE COMMERCIAL VEHICLE discovered an active indication of the Champion sales campaign in southern California and a slight investigation traced its source to the presence of an Overland delivery truck which had been driven overland from Toledo. Two Overland 1200-lb. delivery vehicles with covered bodies left Toledo on January 15. The two trucks came all the way to Los Angeles together and had similar experiences and adventures except for minor details. The one now working in California was manned by F. C. Rolph and E. F. Hess. The one now working in the Northwest was driven by H. R. Klein and E. M. Oliver. One has remained in California and has been driven more than 11,000 miles since January 15. It is scheduled to continue its work in California through the summer and be driven back across the country for the Champion salesmen's convention in the fall, making about 25,000 miles total travel. The other car is now working in the northwest states of Oregon and Washington and has probably completed about a similar mileage. One of the trucks was new and the other before starting had been driven to Texas and Louisiana and back to Todelo.

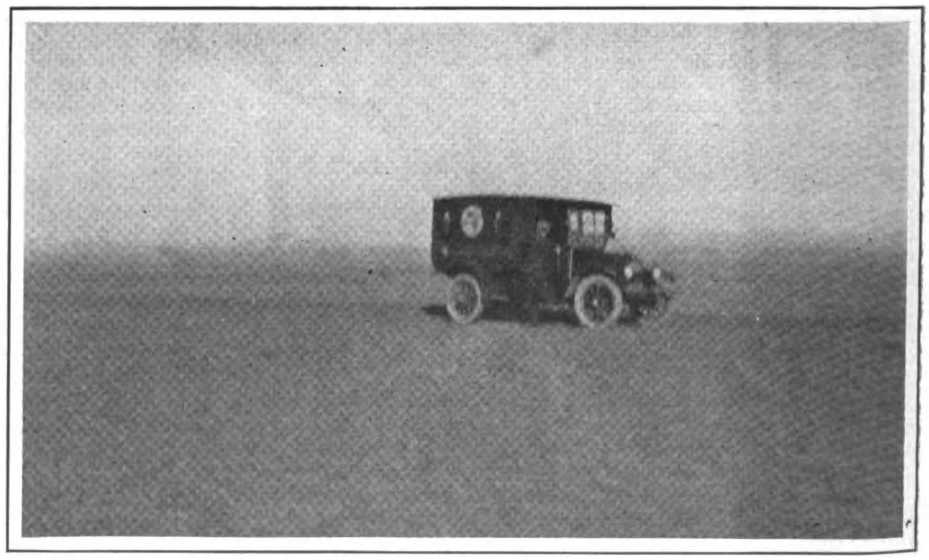
The trip was made on a leisurely schedule carrying out the object of the cruise to call on all garagemen and accessory dealers and put in for them Champion Plug window displays and posters and place road signs along the way. The vehicles constantly carried loads of about 1200 lb. of advertising matter. No camping equipment was carried, the crews stopping at hotels, which served very well except in New Mexico and Arizona, where they think they would have been much more comfortable camping.

Cities Traversed

The entire trip to the coast traversed the following principal cities, starting at Toledo: To Chicago, Galesburg, Ill., Quincy, Ill., Chillicothe, Mo., Kansas City, Mo., Emporia, Hutchinson and Syracuse, Kansas, La Junta, Col., Trinidad, Col., Las Vegas, N. M.; Santa Fe, N. M.; the end of the Santa Fe trail, thence via the old trail route to Albuquerque, N. M., then south to Deming, N. M., Lordsburg, N. M., Safford, Ariz., Globe, Phoenix, Ariz., constantly working southward to dodge snow blocking mountain passes at a time when trains were not getting through. Then from Phoenix via the Parker Cutoff, a terribly rough road to Cadiz, Cal., thence across the desert to Barstow, San Bernardino and over beautiful paved highways, the first encountered in many miles, to Los Angeles. The first impassable stretch which the vehicle could not cover under its own power was at the Gila River in Arizona. Here the drivers found a bridge with two spans washed out and the river gradually deepening to a channel of swift running water in the middle with quicksand bottom. Several cars had been lost due to their owners trying to pass and sucking in water and stalling the engine, when the quicksand made a quick job of engulfing the machine.

A Novel Caravan

As they paused to consider the problem, a force of ten Indians on horseback swooped down on them and after some



Alone on the big Colorado desert, with oceans upon oceans of sand on every side as far as the eye can see. It is no place to run out of fuel or food

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parleying with the leader a price was agreed on. Each Indian had a lariat, and with one end of this fastened to the saddle pommel and the other to a proper point of attachment on the truck, the ten Indians spread out in a huge double fan and, with the engine shut off, the truck was floated over the river in quick time, with the water rushing clear above the floor, while Rolph and Hess held their feet up clear of the flood and wondered what the fates had in store.

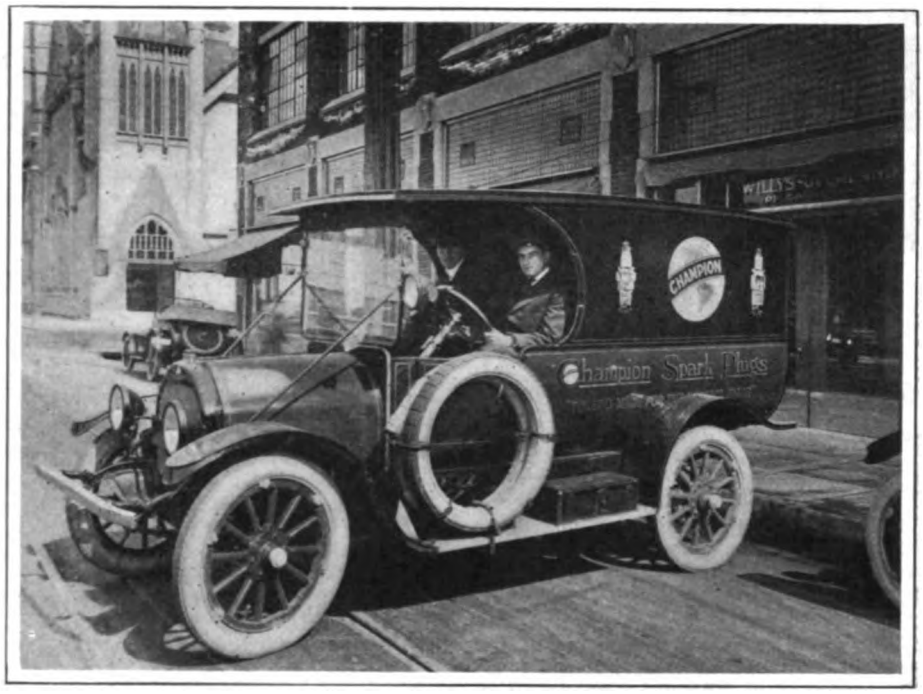
In one part of the great southern desert they passed the vast tract which the Goodyear Tire & Rubber Co. was clearing to plant cotton.

In the 200 miles or more between Parker, Arizona and Barstow, California, continuous desert road, they did not meet a single automobile.

Arizona roads were the toughest on tires of any encountered. The most expensive road condition was that found in the district of Malapai volcanic rock, in Arizona. The roads are full of sharp rocks which cut the tires like glass or knives. The only Arizona roadwork they found on the route they traversed which amounted to anything was that from Wickenberg to Parker, which is now partly completed.

In the Glorietta mountains between Santa Fe and Albuquerque the trucks went up a long grade with eighteen hairpin turns and at some of these turns the angle was so acute that it was necessary to back three times to get around. Backing out to the edge of a hairpin requires confidence in the brakes when the fall is possibly 1,000 ft. or more.

Sand was encountered at its worst in the Colorado Desert. Going into Parker there was a stretch of 15 or 20 miles where it rolled up nearly to the hubs as the truck trundled along. After getting into Los Angeles, they hurried north over the paved highway, extending for practically all the 500 miles up to the center of the state to San Francisco, where they attended the motor vehicle show, then worked back leisurely through the towns of California's great central valley.



One of the Overland 1200-pounders at the finish of the Toledo-Los Angeles leg of the journey. The Willys-Overland branch in Los Angeles is seen in the background

Trucks Increase Efficiency of Infantry and Cavalry—General Parker

NEW YORK, June 2—Details concerning the proper use of motor trucks in military action have been outlined by Brig.-Gen. James Parker, U. S. A., in a recent issue of the *Journal* of the U. S. Cavalry Assn. His conclusions are as follows:

"Infantry in friendly country can travel 100 miles a day in motor trucks. If opposed by troops in hostile country it must travel slowly. Motorcycles can seldom replace cavalry in scouting and advance guard work, because they cannot leave the road or scout off the road on foot without great delay.

"Speed does not protect a truck train. Presence of hostile troops requires outguards to prevent delays by obstacles placed in the road, destruction of bridges, etc. This is true even if machine guns are carried.

Infantry Cannot Act Independently

"Infantry in motor trucks cannot act independently. It requires an escort of cavalry. Motorcycles replace cavalry only to a small extent. Furthermore, assuming unimpeded arrival at destination, cavalry will then be needed.

"How can cavalry accompany motor trucks? It is believed that 200 miles can be covered in four days by having each horse ridden half the time and led the balance of each 50-mile daily march, each trooper riding and leading two horses 25 miles and then riding the other 25 miles in the trucks. Extra forage would be required for horses undergoing such marches. The order of march would be: cavalry advance guard, cavalry led horses, cavalry (men) in auto trucks, infantry in auto trucks.

Assistance to Cavalry

"The use of motor trucks will be of great assistance to cavalry for long marches or raids, insuring transportation that can conform to the maximum rate of march that might be used, which wagon transportation cannot do. Motor trucks and motorcycles do not replace cavalry, but greatly increase their efficiency."



Some of the truck's work—a Champion spark plug window display made up from the material which the truck carried

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The Readers' Forum

Devoted to topics pertinent to commercial vehicle operation, design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

GARAGE SYSTEMS AND METHODS

New Havenite Wants Cost System and Maintenance Hints

To the Editor, COMMERCIAL VEHICLE:

Will you please advise me if you publish a cost system for motor truck garages along the lines of THE COMMERCIAL VEHICLE Cost System for Motor Trucks?

Will you also please advise us of the dates of issue of articles published in THE COMMERCIAL VEHICLE regarding the management of motor truck garages?—H. W. Osgood, J. A. Morris, International Motor Co., New Haven, Conn.

The Motor World Publishing Co., 239 West Thirty-ninth Street, New York City, publishes the Motor World Simplified System of Accounting. This system is particularly designed for dealers and garagemen and is acknowledged to be without a peer in the work for which it is designed. It comes all in one book under one cover and sells for $15 complete, including one sectional post binder bound in full, genuine gray army duck with heavy leather corners; one division leather-tabbed alphabetical index; three additional special leather-tabbed division leaves and 400 forms of three types; 100 of Form 1, 100 of Form 2 and 200 of Form 3. Extra sheets may be purchased at $2 a hundred.

Some of the best methods of garage management are used in the service stations of truck manufacturers. While these institutions are more than mere garages, you will undoubtedly be able to obtain some good ideas which you can apply to your own business no matter how small it may be in comparison. Several of the large service stations which have been described within the past 2 years in THE COMMERCIAL VEHICLE are as follows:

"Service First in the New Locomobile Branch"—Feb. 15, 1914, pages 20-22.
This article illustrates and describes the physical characteristics of the station and tells briefly of the methods of management in use at the New York City Locomobile branch.

"Service Station A Business Institution"—April 15, 1914, pages 16-22.
This article similarly describes the plan and business methods of the International Motor Co.'s service station in New York City.

"New Gotham Autocar Service Station Model of Business Efficiency"—April 15, 1915, pages 5-9.
As the title indicates this article deals with the business methods pursued at the New York City service station of the Autocar Co.

In addition to the above many articles have been published in THE COMMERCIAL VEHICLE since 1914 regarding garages, but more particularly their physical characteristics. Among such articles are the following:

"Complete Service by Largest Truck Garage"—Feb. 15, 1914, pages 23-26.
This article deals with the garage of the General Motor Truck Co., Detroit.

"Electric Truck Growth Requires Model Garage"—May 15, 1914, pages 14-17.
This article describes the lay-out and maintenance methods used in the Exide Batteries Depot, Inc., New York City.

"New York City's Garages Found to Have Many Serious Faults"—July 1, 1914, pages 5-9.
This treats of the many serious faults found in the garages in New York City as determined by a special investigation made by one of the editorial staff of this magazine.

"Complete Record of Large Fleet in 13 Forms"—July 1, 1914, pages 18-21.
This article tells of the cost keeping and service registering system as used by several owners of large fleets of trucks in Milwaukee, Wis.

"Special Garage Devices Save Time and Money"—Aug. 1, 1914, pages 26-27.
This article tells of special garage equipment which owners have found of benefit in business.

"Faults and Features of Charging Plants"—August 15, 1914, pages 22-23.
This short article treats of the storage battery charging equipments as found in New York City garages.

"Garage Floor Should be Well Graded and Drained"—Sept. 1, 1914, pages 34-35.
This tells how the garage floors should be graded.

"Position of Heating Coils Important in Garages"—Sept. 15, 1914, pages 18-19.

"Efficiency of Kaufmann & Baer Trucks Largely Due to Model Garage and System"—Oct. 1, 1914, pages 24-28.
This article treats of garage maintenance of one of the largest Pittsburgh, Pa. department stores.

"Sunken Tanks Reduce Danger of Gasoline Storage"—Oct. 15, 1914, pages 42-43.
This article treats of the various ways in which gasoline may be stored in garages.

"Good Light and Drainage and Lack of Columns Are Features of Curtis Electric Garage"—Nov. 1, 1914, pages 22-25.
This article describes and illustrates a model electric garage owned by the Curtis Publishing Co., Philadelphia, Pa.

"Bus Company Finds Model Garage Necessary"—March 15, 1915, pages 20-23.
This story describes and illustrates the garage of the Fifth Avenue Bus Co., New York City.

"Garage Columns Should Not Hinder Truck Moves"—May 1, 1915, pages 20-23.

"Western Model Fireproof Garage Uses Ramps"—May 15, 1915, pages 34-35.
This article describes the Brown Garage, Des Moines, Iowa.

"Loose-Wiles Truck Garage Is Light, Clean and Fireproof—Only Two Exposed Columns"—June 1, 1915, pages 23-27.
This story gives the plan and sectional views of the Loose-Wiles truck garage in Long Island City, New York, where both electric and gasoline trucks used in the delivery of Sunshine Biscuits for the Metropolitan territory are maintained.

2- AND 3-TONNERS BUILT IN 1916

Estimated Production of Other Sizes Manufactured in 1916

To the Editor, COMMERCIAL VEHICLE:

Will you please tell us the production of motor trucks in the United States during 1916 and give specifically the number of 2- and 3-ton models manufactured?—H. P., Chicago, Ill.

As published in the November 1, 1916, issue of THE COMMERCIAL VEHICLE, and again in the May 1, 1917, issue, the production of motor trucks in this country during 1916 totalled approximately 98,000. This production was divided up according to the various capacities approximately as follows:

1500 pounds and under	49,000
1-, 1½- and 2-tons	24,500
3- and 3½-tons	19,600
5-tons and over	4,900
	98,000

The total of 24,500 for the 1-, 1½- and 2-ton models may be further subdivided into the three classifications as follows:

1-ton	9,800
1½-ton	9,800
2-ton	4,900
	24,500

Again the 3- and 3½-tonners may be divided into their respective classes approximately as follows:

3-ton	8,600
3½-ton	11,000
	19,600

The 3½-ton truck is becoming more popular than the 3-ton model, as was shown in the statistics published in THE COMMERCIAL VEHICLE of November 1, 1916, which showed that forty-eight chassis of 3½-ton capacity were offered for 1917 as against thirty-eight in 1916. Only twenty 3-ton chassis were offered at the beginning of 1917, whereas thirty-three were offered in the same period of 1916, showing a decrease of thirteen chassis in the 3-ton class and a gain of ten in the 3½-ton group.

These figures on the number of chassis of the various sizes offered are not to be confused with the number of any particular size produced, the latter figures being given in the approximate production quoted above.

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OPERATING COSTS OF 2-TONNERS

Hartford Coal Dealer Wants Bagged Coal Delivery Price

To the Editor, COMMERCIAL VEHICLE:

Will you please tell me what would be the approximate cost for the operation of a 2-ton gasoline truck handling bagged coal in Hartford, Conn.—M. HUMPHREY, Tunnel Coal Co., Hartford, Conn.

Not knowing more of the particular conditions under which your motor truck will have to operate, it is decidedly difficult for THE COMMERCIAL VEHICLE to give you more than a mere approximation as to the operating cost of such a vehicle.

In order to give you more complete information you should supply us with answers to the following questions:

1. Number of miles per day which trucks will cover.

2. Whether driver alone will unload the coal or whether he will be provided with a helper for this work or whether he will employ one or more men who proceed from point of delivery to point of delivery to carry the bags of coal from the sidewalk into the houses in which they are to be deposited. This is a very important consideration because a great proportion of the truck's time is wasted through idleness where the driver must unload the truck and carry the coal into the house.

3. Number of trips per day.

In regard to the items which you must calculate in order to determine your cost accurately they should include the following:

Fixed Charges

Insurance, ...$.....
Interest at 6 per cent ....
Depreciation at 20 per cent..... .....
Taxes and licenses..... .....

Total .....$.....

Maintenance Charges

Tires .....$.....
Gasoline .. cents per mile..... .....
Repairs at 5 to 10 per cent..... .....
Overhauling, painting, etc..... .....
Spare vehicle rental ....
Garage rental ....

Total .....$.....

Operating Charges

Gasoline, .. gallons at .. cents....$.....
Oil .. gallons at .. cents..... .....
Kerosene .. gallons at .. cents.... .....
Waste .. pounds .. at .. cents... .....
Washer's time .. cents per hour... .....
Driver's time .. cents per hour.... .....
Helper's time .. cents per hour... .....
Mechanic's time .. cents per hour. .....
Miscellaneous ....

Total cost .....$.....

Total miles ....
Total tonnage ....
Total commercial ton-miles ....
Cost per commercial ton-mile.....$.....

The commercial ton-mile is figured by multiplying the total ton-mileage of each trip by the total tonnage transported on that trip.

The following figures, which were published on page 9 of the February 15, 1915, issue of THE COMMERCIAL VEHICLE, give the operating cost of a 2-ton truck, in this case an Autocar, used in the delivery of bulk coal in Philadelphia, Pa., by Owen Letter's Sons, and may be of some value to you:

	Cost per Day
Depreciation, life 5 years at cost of $2,175	$1.20
Interest on investment at 6% per year	.36
Garage rent	.30
Insurance, fire and liability	.41
Driver's pay per day	2.50
Fuel, 6.7 gallons at 16 cents	1.08
Oil, 3 quarts at 60 cents per gallon	.45
Grease, 3 pounds at 6 cents per pound	.18
Tires 7,000 miles per set at $254 at 50 miles per day	1.80
Repairs at 3 cents per mile	1.50
Total	$9.78

MAKERS OF WOOD TRUCK BODIES

Names and Addresses of Concerns That Manufacture Special Bodies

To the Editor, COMMERCIAL VEHICLE:

Will you please furnish me with the names and addresses of the manufacturers of special bodies for trucks of ¾-, 1- and 2-ton capacity?—A. F. D., City Sales Agency, Inc., New Orleans, La.

The following concerns manufacture wood commercial vehicle bodies:

Abbott & Downing Co., Concord, N. H.
Abresch Co., Chas., Milwaukee, Wis.
Albert Bros., New York, N. Y.
American Body Co., Buffalo, N. Y.
American Wagon Co., Dixon, Ill.
F. A. Ames Co., Owensboro, Ky.
Anderson Motor Co., Rock Hill, S. C.
Armstrong-Johnston Mfg. Co., Columbus, Ohio.
Auburn Wheel & Mfg. Co., Auburn, R. I.
Auto Body Co., Lansing, Mich.
Auto Body Works, Nashville, Tenn.
Auto Metal Co., Springfield, Mass.
Bailey Mfg. Co., North Wales, Pa.
Bailey & Bowne, Utica, N. Y.
Baldwin & Son, D. W., New Haven, Conn.
Barrett Mfg. Co., Peter, Brooklyn, N. Y.
Biehls Carriage & Auto Works, Reading, Pa.
Blue Ribbon Auto & Carriage Co., Bridgeport, Conn.
Bollwerk & Bro., H., St. Louis, Mo.
Bornhein Auto Co., St. Louis, Mo.
Bowe Carriage Co., Wilmington, Del.
J. G. Brill Co., Philadelphia, Pa.
Brown Auto Carriage Co., Cleveland, Ohio.
Brownell & Burt, Taunton, Mass.
Central Auto Body Co., Hartford, Conn.
Charlotte Wagon & Auto Co., Charlotte, N. C.
Chicago Carriage & Trimming Co., Chicago, Ill.
Cincinnati Panel Co., Cincinnati, Ohio.
Collins Carriage Co., Camden, N. J.
Collins Vehicle Woodwork Co., St. Louis, Mo.
Columbia Wagon Co., Columbia, Pa.
Commercial Auto Body Co., St. Louis, Mo.
Cooling Carriage Co., Wilmington, Del.
Cope Co., Irvington, N. J.
Currier-Cameron Co., Amesbury, Mass.
Dann Bros., & Co., New Haven, Conn.
Donegan Auto Body & Specialty Co., Hartford, Conn.
Donigan & Nielson, Brooklyn, N. Y.
Eagle Wagon Works, Auburn, N. Y.
Economy Mfg. Co., Indianapolis, Ind.
Erby & Sons Co., Chicago, Ill.
Erdman-Guider Co., Detroit, Mich.
Fitz Gibbon & Crisp, Trenton, N. J.
Fulton Walker Co., Philadelphia, Pa.
Geissel & Sons, A., Philadelphia, Pa.
General Woodwork Co., Cincinnati, Ohio.
Louis Golide, Cleveland, Ohio.
Haberer & Co., Cincinnati, Ohio.
Hannibal Motor Wagon & Body Co., Hannibal, Mo.
Highland Body Mfg. Co., Cincinnati, Ohio.
Hoover Wagon Co., York, Pa.
Hopkins Mfg. Co. of N. Y., Hanover, Pa.
Geo. H. Jewett Co., Worcester, Mass.
James Kidney Co., Cincinnati, Ohio.
Kingsbury-Leahy Co., Albany, N. Y.
Kipp Wagon Co., New York, N. Y.
Klinger Bros. Co., Brooklyn, N. Y.
Koenig & Luhrs Wagon Co., Quincy, Ill.
Lally Commercial Body Co., Everett, Mass.
Lange Wagon Co., Pittsburgh, Pa.
Leaman Co., John M., Milwaukee, Wis.
Leonhardt Wagon Mfg. Co., Baltimore, Md.
Lowell Auto Body Co., Lowell, Mich.
McCardell & Co., J. R. S., Trenton, N. J.
McKay Carriage Co., Grove City, Pa.
Mack Mfg. Co., Lancaster, Pa.
Martin Carriage Works, York, Pa.
Mertz Co., Cleveland, Ohio.
Metropolitan Auto & Carriage Co., Bridgeport, Conn.
Mifflinburg Body & Gear Co., Mifflinburg, Pa.
Milburn Wagon Co., Toledo, Ohio.
E. M. Miller Co., Quincy, Ill.
Monahan Vehicle Co., Providence, R. I.
Motor Truck Body Co., Detroit, Mich.
J. W. Mount Co., Red Bank, N. J.
Mulholland Co., Dunkirk, N. Y.
New Haven Carriage Co., New Haven, Conn.
New Ideal Wagon Works, New York, N. Y.
Niederhut Carriage Co., Denver, Col.
Oettinger Wagon Co., Greensboro, N. C.
Parry Mfg. Co., Indianapolis, Ind.
Paterson Vehicle Co., Paterson, N. J.
Peters Wagon & Auto Works, Baltimore, Md.
Rech-Marbaker Co., Philadelphia, Pa.
Irvin Robbins & Co., Indianapolis, Ind.
Roeder Mfg. Co., Brooklyn, N. Y.
Sargent & Ham Co., Boston, Mass.
Schaefer Wagon Co., Gustav, Cleveland, Ohio.
Schildmachter Carriage Co., New York, N. Y.
Geo. Schmitz & Bro., Buffalo, N. Y.
Schnabel & Sons, G. A., Pittsburgh, Pa.
Schoeler Bros., Milwaukee, Wis.
Scholl & Son, Brooklyn, N. Y.
Schubert Wagon Co., August, Oneida, N. Y.
Schukraft & Sons, Wm., Chicago, Ill.
Sebastian Wagon Co., New York, N. Y.
Shadbolt Mfg. Co., Brooklyn, N. Y.
Smith Carriage Co., R. P., Rochester, N. Y.
Stunkard Bros. Buggy Co., Brazil, Ind.
Sturtevant-Larrabee Co., Binghamton, N. Y.
Tegetmeier & Riepe Co., New York, N. Y.
Topford Co., Hempstead, N. Y.
Trippensee Mfg. Co., Detroit, Mich.
Troy Mfg. Co., Troy, Ohio.
Uhlenhaut Bros. Wagon Co., St. Louis, Mo.
Union Wheel Works, Newark, N. J.
Von Domarus Sons Co., Geo., Chicago, Ill.
Walker Carriage Co., Merrimac, Mass.
Warnsmann, Henry, Cleveland, Ohio.
O. M. Weber Co., North Wales, Pa.
Welch & Suthergreen Co., Fitchburg, Mass.
Werner & Sons, Geo., Buffalo, N. Y.
Western Auto Body Mfg. Co., Los Angeles, Cal.
Whitman Agricultural Co., St. Louis, Mo.
Sam Williamson, El Paso, Texas.
Willoughby Co., Utica, N. Y.
Wright Carriage Body Co., Moline, Ill.
Thomas Wright Co., Jersey City, N. J.
York Carriage Co., York, Pa.
York Wagon Gear Co., York, Pa.
Ypsilanti Body Co., Ypsilanti, Mich.
Zimmerman & Sons, F. F., Waupun, Wis.

USERS OF BORG & BECK CLUTCHES

Trucks Made East of Chicago Fitted With Clutches of That Make

To the Editor, COMMERCIAL VEHICLE:

Will you please send us a list of the truck manufacturers east of Chicago who employ the Borg & Beck clutch on one or all of the various models which they are now offering on the market?—I. N. M. Co., New York City.

The following list of trucks employ Borg & Beck clutches on either one or more of the different sizes:

Acason	Menominee
Beech Creek	Mercury
Federal	Niles
Fulton	Palmer-Moore
Harvey	Rainier
Indiana	Rush
Jeffery	Service
KisselKar	Universal
Larrabee	Zeitler & Lamson

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New 2-ton Stewart Has But Nine Grease Cups; Uses Non-rattle Muffler

STEWART SPECIFICATIONS

Capacity, lb.	2,000
Price	
Wheelbase, in.	156
Tires, front	34x4
Tires, rear	34x4d
Bore, in.	4⅛
Stroke, in.	5½
N. A. C. C. hp.	27.20
Speed, r.p.m.	1400
Speed, m.p.h.	15
Gear ratio in high gear	9-1
Final drive	Internal-gear

ONE new model of 2 tons capacity has just been added to the Stewart line, made by the Stewart Motor Corp., Buffalo, N. Y. Like the other three models, which were described and illustrated in the April 1, 1917, issue of THE COMMERCIAL VEHICLE, the newcomer employs a Celfor internal gear-driven rear axle. The other units of the present line consist of ¾-, 1- and 1½-ton models, all following the same general design.

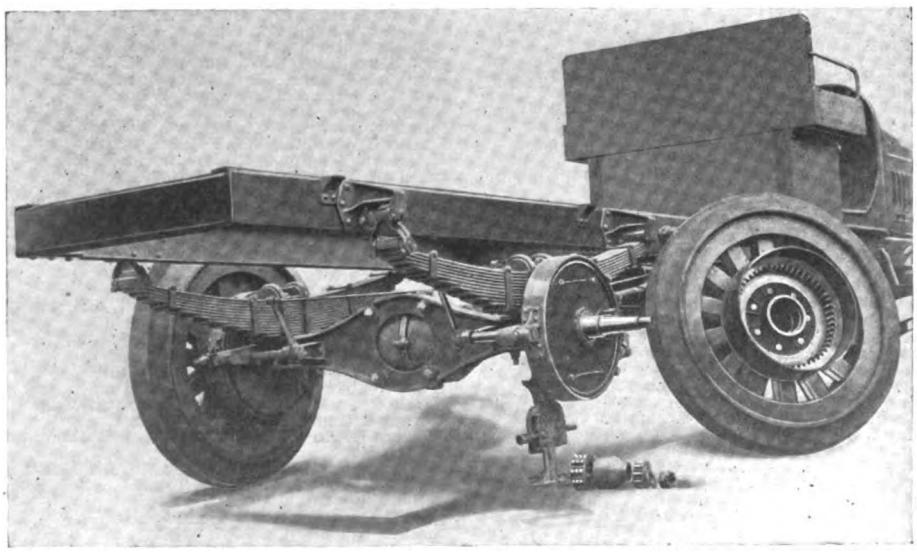
The new 2-ton model is built along conservative lines, but is especially characterized by the reduction in the number of grease cups. This has been accomplished through the use of Bound Brook oil-less bearings in the springs, spring shackles and brake countershafts, so that only nine grease cups remain on the chassis. These are located as follows: Two on the rear axle outer spur gearshaft bearings; two on the rear axle brake shafts; two on the pedal lever shaft on the gearset bellhousing; two on the front axle king pins, and one at the center joint on the driveshaft to take care of the lubrication of the self-aligning ball bearing on which the universal is carried.

Another feature is the use of an electrically welded muffler which is made by the Buffalo Pressed Steel Co., and is practically rattle-proof because of the welded connections of its various parts.

The engine, which is a Buda, 4⅛ by 5½, is mounted in a unit with a Fuller & Sons dry-disk clutch and a Fuller selective three-speed gearset. It is carried under a conventional hood forward of the dash, the hood being similar to that used on the other Stewart models. The engine cylinders are cast in block and the valves are located on the right. Water cooling is employed with a centrifugal pump to furnish the circulation. The radiator has a cast-iron case and a vertical finned-tube core. The carbureter is fed by gravity from a 16-gal. tank carried beneath the driver's seat. The engine is governed to 1400 r.p.m. by means of a Pierce centrifugal governor driven off the motor and limiting the maximum speed of the truck to 15 m.p.h. in high. Ignition is on the single plan with a Berling high-tension magneto. The spark advance is fixed. From the engine the power is transmitted through a ten-plate Fuller clutch to the Fuller three-speed selective gearset in which the shafts are carried on double-row annular bearings. From the gearbox the drive is taken through a three-jointed tubular propeller shaft with a center joint supported on self-aligning ball-bearings in a frame cross member slightly at the rear of the driver's seat. The rear member of the driveshaft transmits the power to the Celfor internal-gear-driven axle, which is carried on springs arranged on the Hotchkiss plan to take both the driving torque and propulsion.

Both sets of brakes are located on the rear wheels, the hand set being of the internal-expanding type and the foot set of the external-contracting design. The frame of the truck is of pressed steel and is built on the semi-flexible plan. It is straight sided throughout and measures 32 in. transversely from outside to outside. This dimension is standard for the frames on the entire Stewart line, although of course the other dimensions are different according to the capacities of the trucks. The frame of the 2-tonner is 5⅞ in. deep, 2½ in. wide and ⅛ in. thick. Wood wheels with square spokes are provided both front and rear. Swinehart pressed-on tires, 34 by 4 in the front, and 34 by 7, of the same make, on the rear, are furnished as standard equipment. At an extra cost of $25 4-in. duals are provided at the rear instead of the 7-in. singles.

Left steer and center control are employed, the steering gear being of Ross manufacture. The truck is furnished with a driver's seat with back as standard equipment, along with a front bumper, two side and one rear oil lamps, tool kit, tool box on runningboard and a mechanical horn. The fenders are of pressed steel. The space aft of the driver's seat permits of fitting bodies 10, 11 or 12 ft. long.



Rear view of the new Stewart 2-tonner, showing method of spring mounting and construction of the Celfor internal-gear-driven rear axle

Acason Brings Out 5-tonner with 192-in. Wheelbase to Take 17-ft. Body

A NEW 5-ton truck with a wheelbase of 192 in. and capable of taking a stake body 17 ft. long has just been brought out by the Acason Motor Truck Co., Detroit, Mich. The new model is called a Super-Five but differs from the regular 5-ton model made by the Acason company only in respect to price and wheelbase. Like all the other models of the Acason line, the newcomer is worm driven. It may be supplied with either wood or metal wheels, the latter at an extra cost.

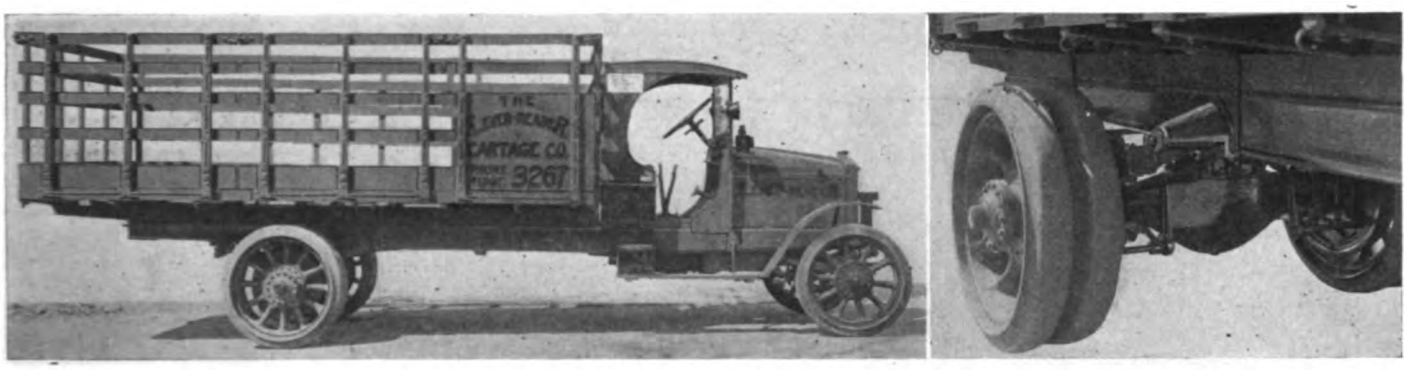
Three other new Acason models, a 1½-tonner, a 3½-ton special and a 5-ton unit were brought out less than 2 months ago and were described in the May 1, 1917, issue of THE COMMERCIAL VEHICLE. In addition to these three models and the long-wheelbase 5-tonner illustrated on the opposite page, the Acason company also manufactures 2- and 3½-ton trucks. All vehicles follow the same general lines and are mostly assembled from standard parts.

The engine of the 192 in.-wheelbase model is made by the Waukesha Motor Co., and is carried under a conventional hood forward of the dash with a graceful sloping top hood member. The engine has its cylinders cast in pairs with the valves at the left and is cooled by means of a centrifugal pump circulating

ACASON SPECIFICATIONS

Capacity, lbs.	10,000
Price	
Wheelbase, in.	192
Tires, front	36x6
Tires, rear	40x6d
Bore, in.	4¾
Stroke, in.	6¾
N.A.C.C. hp.	36.15
Speed, r.p.m.	900
Speed, m.p.h.	10-11
Gear-ratio in high gear	
Final drive	Worm

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Side and three-quarter rear view of the new Acason 5-ton model with a wheelbase of 192 in. The steel wheels shown are furnished at extra cost

the cooling water through a cast-iron-case radiator with a core made up of zig-zag tubes. Carburetion is by means of a Stromberg unit, fed on the vacuum system from a tank located under the driver's seat. The maximum speed of the motor is governed to 900 r.p.m. by means of a Waukesha centrifugal-type governor driven off the motor. At this engine speed the maximum miles per hour of the truck are between 10 and 11. Ignition is on the single plan with an Eisemann high-tension magneto employing a hand-controlled spark advance.

From the engine the drive is taken through a Borg & Beck dry-plate clutch and thence to a Cotta constant-mesh, individual-clutch gearset mounted in a unit powerplant. The gearset has three speeds forward and one reverse and the total gear ratio in low is 55 to 1. From the gearset the drive is transmitted to a two-part shaft to the Timken worm-driven rear axle which is supported on springs made by the Detroit Steel Products Co. and arranged on the Hotchkiss plan to take both the driving and the propulsion stresses.

Both sets of brakes are on the rear wheels and both are of the internal-expanding type. The frame is of pressed steel built on the semi-flexible plan. If wood wheels are supplied, they are of Hayes manufacture and if metal, of Smith make.

Right steer and center control are employed, the steering gear being of Ross manufacture.

New Higrade 1500 to 1750-pounder Has Special Headlight Brackets

DESIGNED with the end in view of producing a high-class truck made from truck rather than passenger car parts, the new Higrade commercial vehicle offered by the Higrade Motors Co., Grand Rapids, Mich., is rated at between 1500 and 1750 pounds load capacity when fitted with standard equipment. This consists of 34 x 4½ pneumatics, front and rear. By the use of oversized tires, 35 x 5, which will fit the rims furnished with the truck, its capacity may be increased 25 per cent without overloading the springs.

The Higrade company is headed by J. Elmer Pratt, who has been connected with the motor vehicle industry since 1893 and who was identified with the Pierce-Arrow Motor Car Co., Buffalo, N. Y., for 7½ years. The company is at present erecting a factory in Grand Rapids, Mich., and expects to start active production early in July. The first 1000 vehicles will be made at the experimental shops of the company at Harbor Springs, Mich., where it has a plant capable of a five-vehicle-per-day capacity.

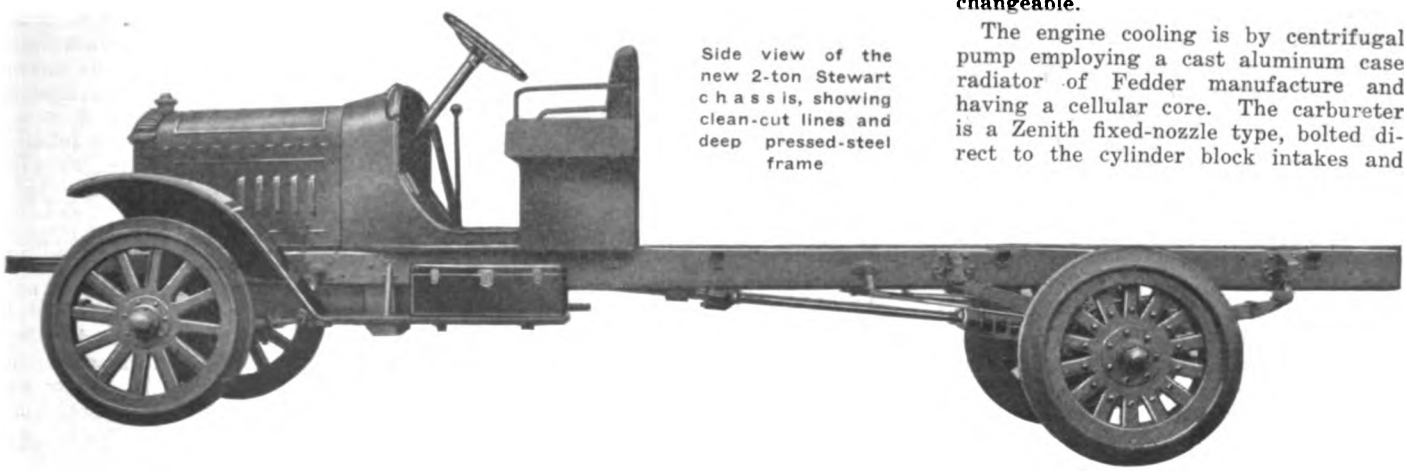
HIGRADE SPECIFICATIONS

Capacity, lb.	1500-1750
Price	
Wheelbase, in.	115
Tires, front	34x4½
Tires, rear	34x4½
Bore, in.	3¼
Stroke, in.	5
N. A. C. C. hp.	16.92
Speed, r.p.m.	1,000
Speed, m.p.h.	20
Gear-ratio in high gear	4.56-1
Final drive	Worm

The truck is assembled mostly of standard parts; has its motor under a hood forward of the dash, final worm drive, and is equipped with electric starting and lighting. One of the features of the vehicle is a specially designed lamp bracket attached to the side of the radiator casing so that the electric headlight may be adjusted for the proper focusing of the rays at any given distance ahead. It is not necessary to dim the lights when passing other vehicles on the road, and the adjustment once made will always stay in place. This is accomplished by mounting the headlight casing on a vertical bar pivoted at its lower end to the radiator casing and working in a slotted bracket at its upper end, so that the entire lamp may be swung forward or backward about the bottom pivot to give the desired focusing effect.

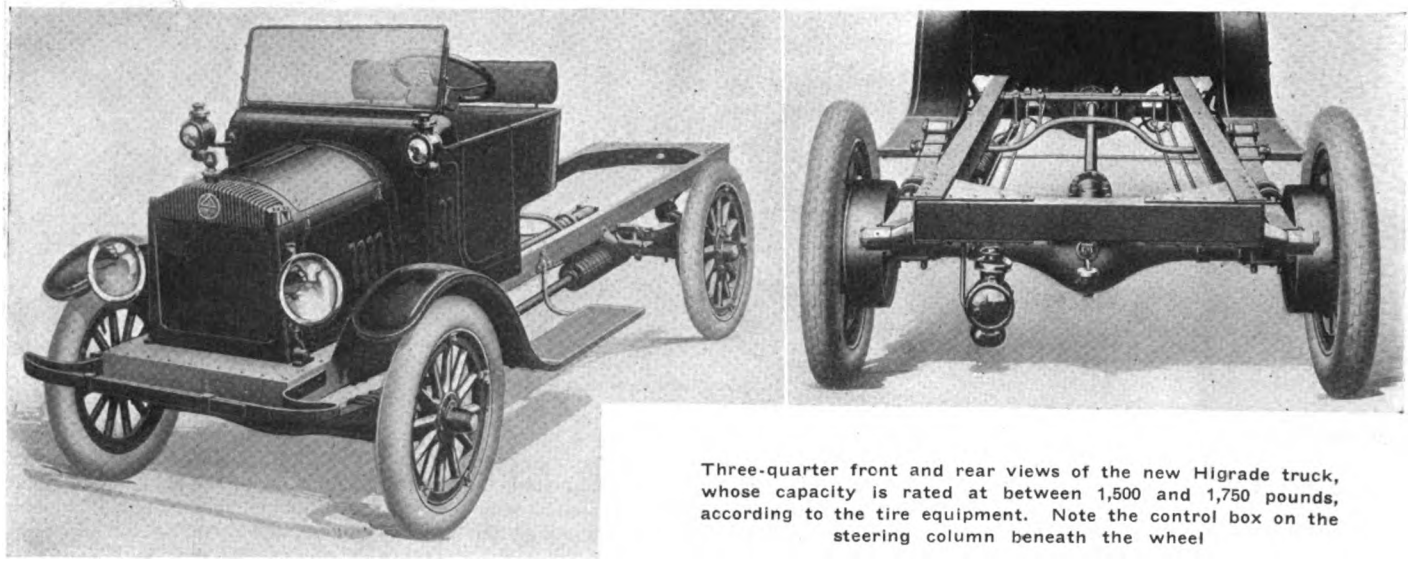
The engine, which is of Wisconsin manufacture, is mounted under a conventional hood forward of the dash, and has incorporated with it a dry-plate clutch and three-speed, individual-clutch type gearset. The cylinders are cast in block with the upper half of the crankcase. The valves are all located on one side of the engine and are driven mechanically by a single camshaft. The intake and exhaust valves are interchangeable.

The engine cooling is by centrifugal pump employing a cast aluminum case radiator of Fedder manufacture and having a cellular core. The carbureter is a Zenith fixed-nozzle type, bolted direct to the cylinder block intakes and



Side view of the new 2-ton Stewart chassis, showing clean-cut lines and deep pressed-steel frame

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Three-quarter front and rear views of the new Higrade truck, whose capacity is rated at between 1,500 and 1,750 pounds, according to the tire equipment. Note the control box on the steering column beneath the wheel

provided with a shut-off to facilitate starting in cold weather. It is controlled by means of a hand lever mounted on a small control box attached to the steering column directly under the driver's handwheel. The carbureter is fed by gravity from a pressed-steel fuel tank mounted on the dash. The engine is fitted with a Simplex governor, driven off the propeller shaft and limiting the maximum speed of the truck in high to 20 m.p.h. A high-tension magneto is used to furnish current for ignition, while a separate lighting generator is provided for the electrical equipment, which also includes a starting unit of the balance wheel type with Bendix drive.

From the engine the power is transmitted to a Borg & Beck single-plate clutch and thence to a Cotta three-speed selective gearset of the individual clutch type. It is then transmitted to the Sheldon worm-driven rear axle through a single shaft with a universal on each end. The rear springs, which are the semi-elliptic type, are arranged to take both the driving torque and propulsion.

The brakes are both on the rear wheels and are of the internal-expanding type. The frame is of pressed steel of channel section, 4 in. deep, with horizontal members 2½ in. wide. It is made of 3/16-in. stock and is built up on the flexible plan of construction without cross members except at the extreme front and rear.

The wheels are wood and are made up in the artillery type with twelve spokes each. The spokes are mounted centrally in the felloe. The steering gear is a Lavine truck design of the semi-irreversible worm type. In addition, a control box is mounted directly in front of the steering column and just in below the steering wheel. This box has all the switches and controls for the electrical instruments, the speedometer and the carbureter adjustment.

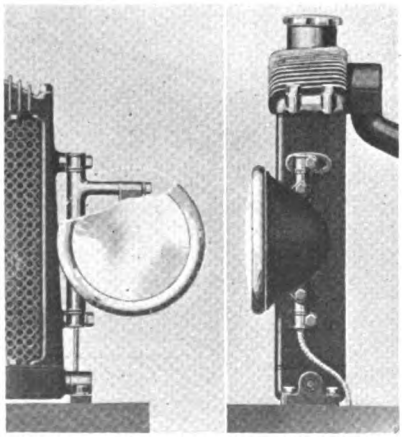
The standard equipment furnished with the truck includes a speedometer, a motometer, headlights, windshield, dash and rear oil lamps, electric horn, tool box and tools, extra rim and tire-holder, oil can and 1 gallon of oil. The cab is inclosed with fore doors and is furnished with a full-width upholstered seat and backrest. The frame length back of the driver's seat is 104 in. and the bed floor for the body is but 31 in. from the ground.

Gem ½-tonner Is Offered Complete with One of Three Body Types

GEM SPECIFICATIONS

Capacity, lbs.	1,000
Price	$675
Wheelbase, in.	172
Tires, front	31x4
Tires, rear	31x4
Bore, in.	3¾
Stroke, in.	4¼
N.A.C.C. hp.	22.50
Speed, r.p.m.	
Speed, m.p.h.	
Gear-ratio in high gear	
Final drive	Bevel

THE Gem Motor Car Corp., Grand Rapids, Mich., has just brought out a light delivery vehicle which sells complete with body at prices ranging from $675 to $725 according to the type of body fitted. With an open express body it sells at $675; at $700 with a canopy top type and at $725 with a full panel design.



Front and side views of the novel Higrade headlight bracket support which is pivoted at its lower end to swing backward or forward to focus the rays on the ground at any desired distance

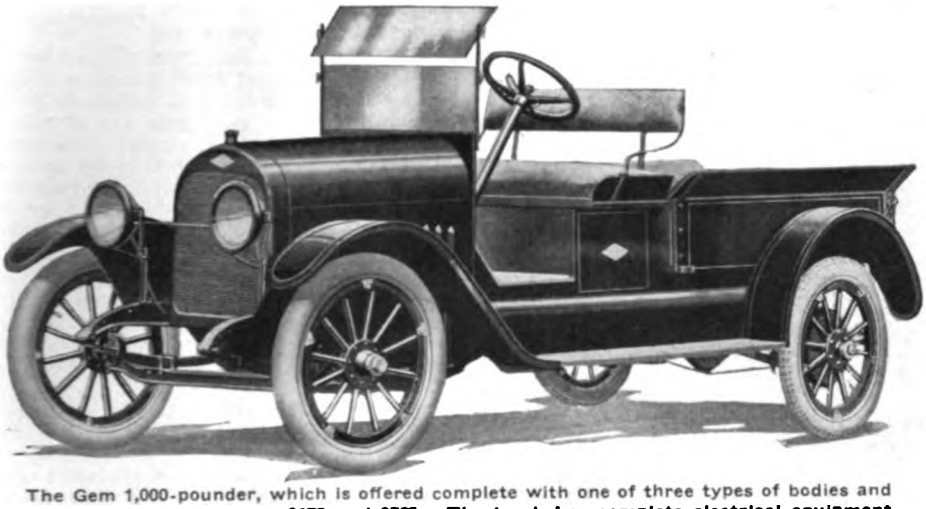
The vehicle has a capacity of 1000 pounds and is built on the same chassis as that of the Gem passenger car. It is assembled from standard parts made by specialists and is electrically equipped with both starting and lighting units.

The engine is a 3¾ x 4¼ L-head model made by the Golden, Belknap & Swartz Co. It is carried on a three-point suspension in a unit powerplant with a disk-in-oil clutch and a three-speed selective gearset. The engine is water cooled and employs a metal case radiator with a straight-tube core. A Carter carbureter is used, fed from a tank beneath the driver's seat.

No governor is fitted due to the desirability of permitting the vehicle to make high speeds on account of its small load-carrying capacity. The electrical system comprises a starting and lighting outfit of Dyneto make operating at 6 volts and a battery ignition system working in connection with a Detroit 6-volt storage battery with an ampere hour capacity of 80.

From the engine the drive is taken to the Golden, Belknap & Swartz wet-plate clutch and thence to the three-speed selective gearset made by the Grant-Lees Co. and mounted in a unit powerplant. From the gearset the drive is taken to the Walker-Weiss bevel-driven rear axle. The rear springs are arranged on the Hotchkiss plan to take both the drive and torque. The wheels are of wood with twelve spokes on both the fronts and rears. Deformed-tread pneumatics are fitted as standard equipment for the rear

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The Gem 1,000-pounder, which is offered complete with one of three types of bodies and varying in price between $675 and $725. The truck has complete electrical equipment

wheels. Left steer and center control are employed. The body equipment consists of a full-width seat with upholstered back which is fitted with a top for the canopy-cab model selling at $700. The open express body at $675 is of the flare-board type. The panel body has a special seat of its own. In each case the regular passenger car type front and rear fenders are employed, the bodies being of such width as to fit between the inner sides of the rear fenders.

First Completely Motorized Battery an American Innovation

Nearly All Ordnance to Be Motor-Handled

ACCEPTANCE of the principle of motor instead of mule haulage for artillery in the United States Army has at last been realized by the development of what is believed to be the first completely motorized field battery of medium caliber guns in the world.

Experiments have been carried on along these lines for some time by the army officials, and it is indeed gratifying to learn that our army to go abroad will be fully equipped with the latest type of motorized equipment in artillery as well as in the mechanical transport system for the haulage of men, ammunition and food.

That such will be the case is assured by the following statement authorized last week by the War Department at Washington:

"The United States Army has developed what is believed to be the first completely motorized field battery of medium caliber guns in the world. The problem of eliminating the horse entirely from the work of dragging such guns to the front is one on which both European and American engineers were working for years before the outbreak of the great war. Successful experiments by the Government authorities now seem to promise an early substitution of the machine for the horse in handling nearly all forms of ordnance.

"The experimentation was carried on first with various types of tractors under the direction of the Field Artillery Board at Fort Sill, Okla., and by the Ordnance Department of the Army at Rock Island Arsenal, followed later at Fort Bliss, Tex., with a completely equipped battery. The work has been in charge of Major Lucian B. Moody. The tractor standards committee of the Society of Automotive Engineers was enlisted at the outbreak of war and has been actively co-operating in the study of the problem.

Expects Success Soon

"'The success of the experiments at Fort Sill justifies us in believing that the motorization of most medium caliber guns which have previously been horse-drawn will come in the near future,' Major Moody says. 'The large howitzer types are sure to be motorized. The motorization of the light types, such as the French 75s, will have to wait for the development of tractors capable of developing a combination of speed for emergencies and pulling power in mud equal to that of horses. This probably will not come immediately, but we shall continue our experimentation with the light types.'

"European armies have already reduced greatly the number of horses in artillery use, but it has not proved possible so far to eliminate them in hauling certain of the smaller and medium types of ordnance because of the lack of a proper tractor combination of speed and power. The big creeper-type tractors capable of handling the heaviest guns which have so far been used in Europe have been unable to meet the demand for making the occasional bursts of speed necessary for getting the light field guns into position and using the minimum of space which conditions on the firing line frequently make vital.

"The new creeper or self-track-laying type of small or medium size developed by the American Army is built without the steering arrangement in front, and while possessing relatively as much power as the type now used in Europe is at the same time capable of turning within its own length by simply reversing or stopping one of the creeper drivers while the other side continues to move ahead. The development in this type of tractors powerful enough to haul the heaviest guns will make them entirely available for making the sharp turns and corners and fitting into the inconvenient spaces for which horses have so far had to be used at the very front. The experiments have proceeded far enough to justify plans for the successive motorization of all American artillery units except the smallest calibers required to move at very high speed over bad ground.

"The new developments in ordnance traction make up another phase of the valuable experience the American Army gained on the Mexican border, as they are a direct outgrowth of experiments in hauling field guns with American tractors made at that time.

Tractors More Efficient

"The reasons making it highly desirable to substitute the tractor for the horse in all ordnance traction are both scientific and humane. From a scientific and military standpoint the tractor is much more efficient than the horse. It lasts longer, is capable of performing more work in a day, and costs less for repairs and fuel than the expense of upkeep of the horse.

"A tractor can, if necessary, be used 24 hours in a day, while the horse has to stop for rest, sleep and feeding and can seldom be worked more than 10 or 12 hours per day at the best. Repairs on tractors even at the front are usually comparatively brief tasks, unless the machine is completely destroyed by shell fire, while horses are continually liable not only to wounds but to disease and injury from exposure and lack of proper care under field conditions. The care of machines, as compared with that which horses must have, is negligible, while the bulky food supply for horses is always a difficult problem.

"The humane reasons are equally obvious. The life of the artillery horse at the front is not only brief but often one full of agony. It is seldom possible to give the animals anything like proper shelter and care, and their usual lot is quick death by disease if they are not killed off by shellfire."

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Harvey Offers Convertible Body With Lengthwise Seats in Floor



The 2½-ton Harvey truck fitted with the new convertible body in which three longitudinal seats are raised from the floor to carry a maximum of thirty-eight men

DESIGNED particularly for carrying troops, a new and novel convertible type of motor truck body brought out by the Harvey Motor Truck Co., Harvey, Ill., from designs of the inventor, Charles P. Landes, is characterized by three longitudinal seats which when not in use are folded down flush with the floor. In such a position the body has the usual platform floor suitable for carrying all sorts of merchandise. For ease in loading and unloading when used as an ordinary body or for mounting or dismounting of troops when used in army work, the slat sides and end of the body are hinged to swing downward.

The body is 6 ft. wide and 12 ft. long and is designed to be mounted on a 2½-ton Harvey truck. The three seats are 10 in. wide and 12 ft. long, or the entire length of the body. The seats conveniently carry thirty-two men at a minimum and thirty-eight at a maximum. The men sit astride the seats as on a horse and by this method require less room per man than if transverse seats were used. Practically every available inch of floor space is used by the longitudinal seating method, which increases the seating capacity of the average body almost 100 per cent. The seats can be raised or lowered in 3 minutes, thereby transforming the body from a flat platform stake type for carrying merchandise into one for carrying troops, or vice versa.

How Seats Are Held in Raised Position

Each seat is carried on four rods or uprights pivoted at the lower ends and sliding in two U-shaped steel runners bolted on the under side of the wood seat. When fully raised from the floor level, the seats are held from tilting forward by means of small eye-bolt pins dropped through holes in the forward ends of the seats which register with similar holes in a small transverse angle-iron bolted to a steel plate extending clear across the body immediately back of the driver's seat.

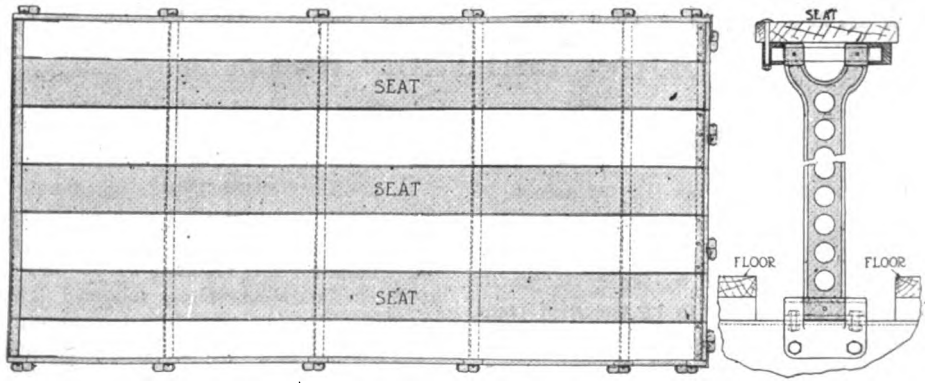
The braces or uprights are made from channel section forgings with a yoked top that carries a transverse pin extending beyond the edges of the yoke on each side to fit within the channel slide members. The brackets are lightened by means of holes, as shown in one of the accompanying illustrations.

The braces are held from sliding backward by means of small plates screwed into the slides and by a metal strip to which all of the yoke pins are attached by means of small U-shaped retainers. This strip is held in position by means of a hook which fits into an eye-bolt attached to the seat so that when once in place, all of the brackets remain in the same relative positions to one another.

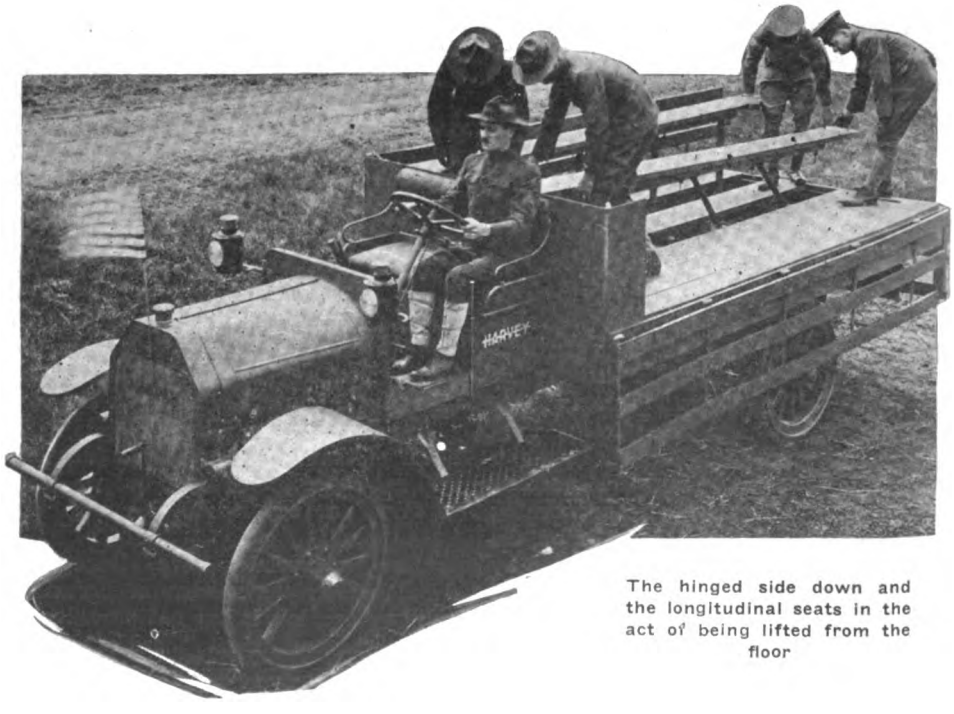
The seats are lifted by means of handles which are swung downward into recesses of the tops of the seats to give a flush floor when the vehicle is used for handling freight or other merchandise.

When lowered, the seats rest on angle irons to form a flush body floor. When lifted, the spaces between the seat openings and the adjacent floor planks are lined with metal forms so that additional loads, such as troopers' equipment, etc., may be carried without any danger of falling through the body onto the ground.

Furthermore, the body is mounted on one of the standard models of the Harvey Motor Truck Co., and conforms closely with the latest specifications of the War Department, having a sufficient-sized motor, four-speed gearset placed amidships and dry-disk clutch.



Plan view of the body, showing the disposition of the three seats. At the right is shown one of the seat brackets



The hinged side down and the longitudinal seats in the act of being lifted from the floor

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Warner Makes Army Type Clutch, Gearset and Control Assembly

Meet Requirements of Army Specifications for Type A Truck

INDICATIVE of progressive business methods and an acknowledgment of the responsibility which is now placed upon every individual, firm or corporation, the Warner Gear Co., Muncie, Ind., has just brought out a new design of gearset, clutch and lever-control assembly to conform with the United States war department specifications for class A army trucks, formerly graded as of 1½-ton capacity. These three units are now in production.

Because of the very severe requirements of the army specifications, which were published complete in the May 1, 1917, issue of THE COMMERCIAL VEHICLE, all three units are considerably oversized as compared with the similar assemblies for ordinary commercial truck use. All three units are here illustrated.

The gearset is known as model T53 and is of the four-speed, selective type. The gearset housing is of cast-iron and is arranged to be mounted below the truck cross-frame members so it is extremely accessible for removal, inspection or repairs. The housing has a drain plug at the extreme bottom of the case and a generous-sized oil filler plug on the right side.

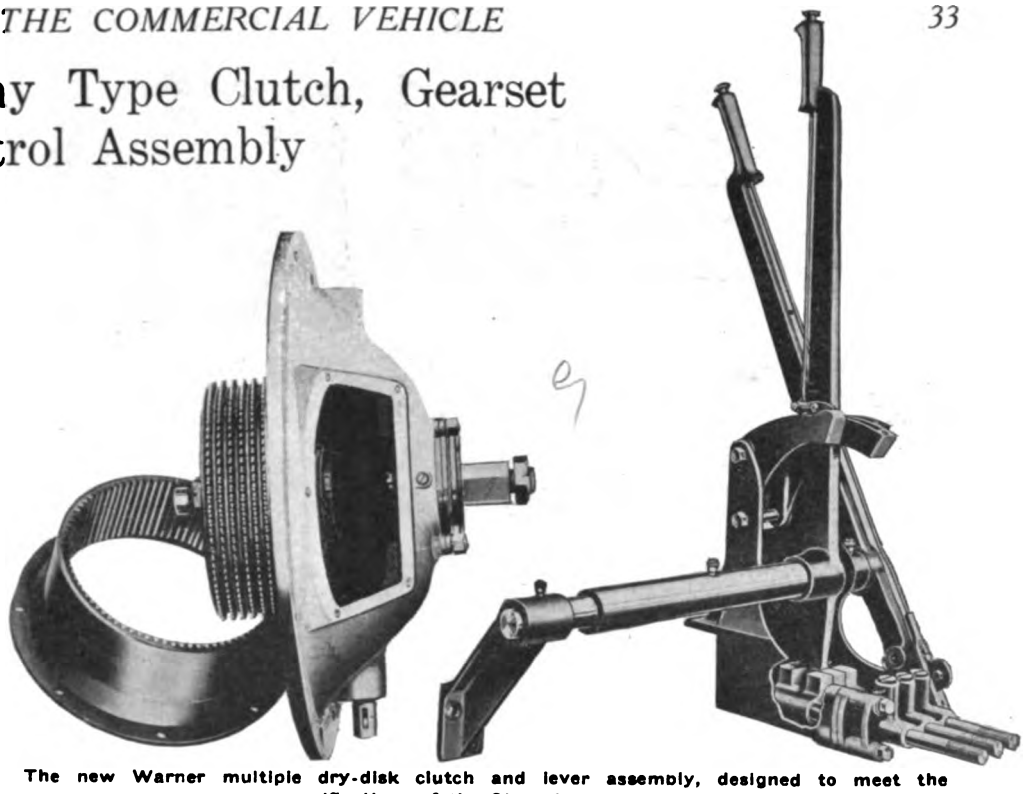
Gears Meet S. A. E. Specifications

All the gears are of forged, heat-treated and carbonized alloy steel, according to S. A. E. specifications. All the gears have 1¼-in. faces, with the exception of the countershaft low-speed gear, which has a 1⅜-in face that allows the larger gear on the double-step reverse gear to mesh with it and start rotating before the smaller integral gear comes into engagement with the thirty-six-toothed mainshaft gear. This permits of an easy engagement of the three gears in the reverse train. Both the countershaft and mainshaft are of alloy steel, heat treated and carbonized. The mainshaft is of splined construction with six keys.

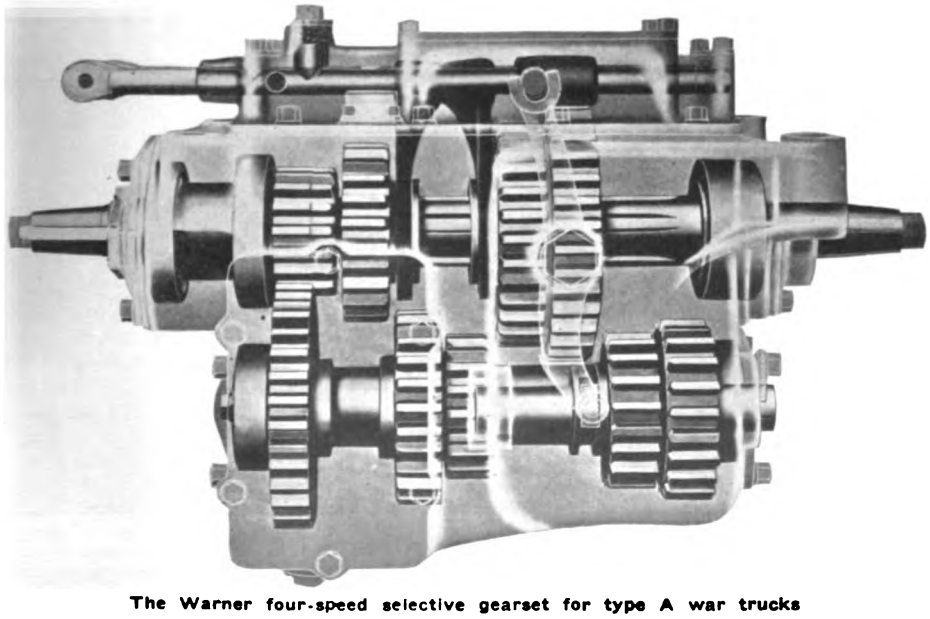
The front and rear shaft connections are cut on the standard S. A. E. taper. The shafts and gears are mounted on annular bearings, double-row type being used on the rear to carry any excessive load which might be placed upon the truck.

The gear shifting and interlocking mechanisms are carried as a complete unit in a chamber in the cover of the gearbox. When the cover bolts are removed, the unit can be lifted out to permit a thorough inspection of the gearbox interior. The placing of the different shifts is arranged in accordance with government specifications.

Plenty of room between the gearset itself and its casing on the left side makes it possible to install a power drive from the countershaft drive gear should this be necessary. The countershaft reverse gear is cut integral with the shaft and the construction of the stepped sliding reverse gear allows a reduction of 4.99 to 1 on low speed and the lower reduction of 5.78 to 1 on reverse. Both of these are essential qualifications of the government specifications.



The new Warner multiple dry-disk clutch and lever assembly, designed to meet the specifications of the Class A army truck



The Warner four-speed selective gearset for type A war trucks

Control Has H Type Quadrant

The lever control unit designed for use in connection with the T53 gearset is arranged for a center location with left steer so that the levers are at the right of the driver. In accordance with the army specifications, the shifter quadrant is of the H type, in which first speed is forward and left; second speed rear and left; third speed forward and right; fourth speed rear and right, and the reverse in a separate gate guarded by a latch, from the extreme left through neutral and then forward. Both the control and brake levers are of drop-forged steel and the castings of malleable iron.

The clutch to be used in conjunction with the gearset and control units is of the multiple dry-disk type, with seven sets of steel disks having wire asbestos facings attached to the outer or driving disks. The latter are serrated at their outer diameters to distribute the driving forces over a greater area and to prevent peening action, thus avoiding destructive back lash. The clutch pressure is provided by means of three coil springs which allow of adjustment. This adjustment may be easily made through the hand-hole in the clutch housing.

Ball bearings are used throughout. These are lubricated through an oiler in the top of the housing, the oil flowing down through a lead drilled in the center of the clutch shaft with cross-drilled holes to throw the oil directly onto the bearings. Adjustments are also furnished for the outer bearings, which assure a permanent position of the clutch pedal. This adjustment also makes an equal travel of the clutch pedal before the clutch brake comes into action.

The clutch housing is of cast-iron and bolts directly against the flywheel housing in a similar manner to that employed in unit powerplant construction.

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Men and Makers

MACCAR TRUCK CO. has completed plans for a new factory in Scranton, Pa., which will be ready in 5 months and will afford a production of 1500 trucks a year.

Studebaker Corp., South Bend, Ind., has subscribed $1,000,000 of the Liberty loan. One-half this amount will be offered to the employees, but the company will stand back of the whole amount if need be.

United States Motor Truck Co., Cincinnati, Ohio, has tripled its machine shop output by the addition of extra day and night forces.

Selden Motor Vehicle Co., Rochester, N. Y., maker of Selden trucks, in May did the largest single month of business in the history of the company. The production exceeded that of May, 1916, by 261 per cent.

Packard Motor Car Co., Detroit, Mich., is to have a cruise for 450 of its factory men, dealers and salesmen, beginning June 18 and lasting 3 days. The cruise will be on the steamer Noronic, which will go from Detroit to Mackinac Island, thence to Sault Ste. Marie, a short distance into Lake Superior and return.

Ford Motor Co. will establish an assembly plant at Benton Harbor, Mich.

Moore Motor Vehicle Co., Minneapolis, Minn., will erect in the near future a factory for the manufacture of its 1-ton truck. The site of the new factory is being considered, and representatives of the company have been visiting Danville, Ill., for a possible location.

Lamson Motor Truck & Tractor Co. is to move from Chicago to Elkhart, Ind. Architects are now working on plans for a concrete, brick and steel factory, which the company contemplates building.

Consolidated Motors Corp. will manufacture Thomas trucks and armored cars in Schenectady, N. Y. This company was recently formed by Charles K. Thomas to take over the Thomas Auto Truck Co. and the Armored Motor Car Co., both of New York City. The Consolidated company has secured the old Mohawk brewing plant in Schenectady.

Oklahoma Automobile Co. has purchased the building and equipment of the John B. Woods Plow Co., Muscogee, Okla., and plans to convert it into a truck factory.

New York Branch of the White Co. has moved into its new quarters at Park Avenue and East Fifty-seventh Street.

Packard-Columbus Motor Co. has been formed to handle Packard trucks in Columbus, Ohio.

Earle C. Anthony, Inc., has been appointed Packard distributor for the greater part of California. The concern was formerly dealer for Los Angeles alone.

Harrisburg Welding & Brazing Co., Harrisburg, Pa., has taken over the distribution of Armleder trucks in the Harrisburg territory.

Phenix Truck Sales Co. has been formed in Cleveland, Ohio, to deal in motor trucks. The men interested in the organization are Charles Meyer, Stanley Haveleo, W. H. Halborn, James Holan, John J. Metzger, and Max Delfe.

Alvan T. Fuller, Inc., has succeeded Alvan T. Fuller, Boston, Mass., dealer in Packard trucks and cars for eastern New England. The new company is incorporated for $1,500,000 with Mr. Fuller as president.

Goodyear Tire & Rubber Co., Akron, Ohio, has enlisted 98 per cent of its employees in the Red Cross.

Fisk Tire Co., Chicopee Falls, Mass., has given a Knox truck to be turned into an ambulance for the use of the Second Regiment, Massachusetts National Guard.

Polack Tyre & Rubber Co. has moved its general and sales offices from Broadway and Sixty-second Street to the second floor of the Motor Mart, 1876 Broadway, New York.

Kelly-Springfield Tire Co. has completed preliminary plans for buildings to be erected at Cumberland, Md. There will be six buildings in all, with a main factory 600 ft. long, 400 ft. wide, and two to four stories in height. The cost of these buildings will be in the neighborhood of $5,000,000.

Globe Tire Co., LaPorte, Ind., expects to occupy its new factory building within 90 days.

Covert Gear Co., Lockport, N. Y., will turn out the unit and amidship model of motor truck transmission of both the 3-speed and 4-speed type at its newly acquired Detroit plant. The plant, which is a 5-story building, has been taken over on a long-term lease, and will have a production capacity of 200 gearsets per day. New equipment is now being installed and active production will start July 1.

Bimel Spoke & Auto Wheel Co., Portland, Ind., has increased the capacity of its truck wheel department about 200 sets of light and medium truck wheels per day. Six new dry kilns have been added to the equipment at the cost of $60,000. These permit of drying spokes and felloes for small truck wheels at the rate of 400 sets a day. Three or four acres of the new site have been secured and the rim planing and bending departments have been doubled.

Le Roi Co., Milwaukee, Wis., maker of four- and six-cylinder motors for commercial vehicles and tractors, has broken ground for a one-story machine shop, 80 by 175 ft.

Stroh Casting Co., Detroit, made three new production records in March of this year. The foundry turned out 219,723 castings or 687 tons, an increase of 206 tons over last January, which month held the previous high mark. Of these castings 19,019 were transmission cases. The inspection records display a 214-ton increase and the shipping a 679-ton increase.

Fuller & Sons Mfg. Co., maker of motor vehicle parts, showed a production during the past 5 months this year of 2½ times the output for the same period in 1916.



Every one between the ages of 21 and 31, inclusive, has a fighting chance of getting a free ride in the vehicles going over the hill in the above picture. They are 1-ton ambulances made by the Service Motor Truck Co. and there are fifty more like them owned by Uncle Sam

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Here is a Service 1-ton ambulance working for Uncle Sam. Notice the grade it is climbing, evidently practicing for trench work

Packard Electric Co., Warren, Ohio, has taken out group insurance on its employees.

Thermoid Rubber Co., Trenton, N. J., has added a new hydraulic press to its equipment which will permit an increase of 30 per cent in the output of compressed brake lining. This department is running overtime at full capacity, averaging over 37,000 ft. per day. The 1916 output was 9,000,000 ft. and the 1917 production is expected to reach the 12,000,000 ft. mark.

Pyro Ignition Co., New York, will move to Reading, Pa., where it has leased a three-story factory. It will employ forty men and women in the manufacture of spark plugs.

Wallace C. Hood Service Bureau, Detroit, has taken the selling agency for all territory for the Auto Spin Flag Co., a decorative device for use on a motor vehicle radiator cap.

Leslie R. Acton has resigned as vice-president of the Redden Motor Truck Co., Detroit.

Russel Munroe, assistant advertising manager of the Ford Motor Co., has resigned to go to France as an ambulance driver.

Clinton B. Amorous has resigned his position as assistant to the general manager of the Locomobile Co. to become assistant purchasing agent of the Parish Mfg. Co., Detroit, maker of truck frames.

P. W. Hine, M. A. Pollock and F. C. Bancroft have been promoted in the Locomobile Co. Mr. Hine, formerly manager of the Bridgeport, Conn., branch, is now assistant sales manager. Mr. Pollock is now manager of the Bridgeport branch, and Mr. Bancroft is superintendent of the service department of that branch. Bridgeport serves western Massachusetts and the State of Connecticut.

R. C. Stewart, president of the United States Motor Truck Co., Cincinnati, Ohio, was recently presented with an American flag by his employees on the occasion of his sixtieth birthday. The flag now hangs on the company's flagpole in place of the one previously used.

C. T. Schaefer has been made chief of the engineering department of the Globe Motor Truck Co., St. Louis, Mo. He was formerly chief engineer of the Mogul Truck Co.

Walter F. Sheehan has been appointed general manager of the Globe Motor Truck Co., St. Louis, Mo.

John L. Judd has secured the entire United States territory for a Smith Form-A-Truck and Allen combination designed by himself. Mr. Judd is agent for both these lines in Boston and conceived the idea that a 2½-ton truck could be made with the Smith unit and Allen chassis. He suggested the idea to both companies, which took it up, and gave him the sales agency for the entire country. He has contracted for 2000 of these vehicles, which have not been named as yet.

K. H. Mitchell, E. C. Brislev and R. M. Mitchell are president, vice-president and secretary-treasurer, respectively, of the recently formed Packard-Columbus Motor Co., Columbus, Ohio.

G. A. Danner has been appointed in charge of the truck sales department of the Harrisburg Welding & Brazing Co., Harrisburg, Pa., dealer in Armleder trucks.

William J. La Casse has been appointed Pacific Coast supervisor for the Maxwell Motor Sales Corp., with headquarters in San Francisco, Cal.

Leslie Pearson, of the Leslie Pearson Paper Co., will have charge of a branch office in Vancouver, B. C., of the Canadian Pneumatic Tool Co., Canadian distributor of Little Giant motor trucks.

G. H. Miller, Carl Goldenberg and H. J. Kenney have received new appointments in the Polack Tyre & Rubber Co. organization. Mr. Miller is now head of sales and advertising, Mr. Kenney manager of the New Haven branch, and Mr. Goldenberg is the Virginia representative with offices at Lynchburg.

Earl H. Pellett, C. W. Smith and William Domnich have been appointed representatives at Boston, Mass., Washington, D. C., and Pittsburgh, Pa., respectively, for the Polack Tyre & Rubber Co., New York.

E. H. Brandt has been appointed Western sales manager of the Ajax Rubber Co., Inc. His territory will lie west of a line drawn along the eastern boundaries of Michigan, Indiana, Illinois, Missouri, Arkansas and Texas, with the exception of the States of Washington, Oregon, California and Nevada. Mr. Brandt will have his headquarters in New York.

Edward S. Babcox, advertising manager of the Firestone Tire & Rubber Co., Akron, Ohio, has been elected vice-president of the Association of National Advertisers.

L. E. Murray and R. A. Sturgeon have been appointed manager and assistant



In the good old days lumbermen had to ship their logs downstream and depend on the spring freshets to get the lumber to its destination some time. This Garford truck is hauling 3,109 ft. of lumber and asks no questions about the weather. George Wooding, of Enumclaw, Wash., owns the outfit and can realize 2½ cents per board ft. on his haul, which would amount to over $8 per trip when the load is as large as the one in this picture

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Evidently those six ribbons stretching from the broom to the two gentlemen have a hidden meaning. In confidence, they are the tracks of a 3½-ton U. S. motor truck. Three trials for braking efficiency were made of this vehicle. Once it was loaded to 9,000 lb., and going at 13 m.p.h. stopped within 18 ft. of the point where the brakes were applied. The second time with half a load on it stopped at 19 ft., and the third time the empty truck stopped within 24 ft.

manager respectively of the New York branch of the United Motors Service, Inc. Mr. Murray was formerly with the Dayton Engineering Laboratories Co. and Mr. Sturgeon with the Remy Electric Co.

George H. Duck, formerly with the United Motor Truck Co., Grand Rapids, Mich., a past-president of the Motor Truck Club of America, New York City, and at the head of the club's organization for recruiting army motor truck drivers in the Department of the East, has now become actively identified with the Heavy Haulage Co., New York City, due to the increased business of that concern.

H. L. Worbois has been appointed chief engineer and production manager of the A. J. Detlaff Co., Detroit, which is opening a new clutch department to manufacture a new design of disk clutch for trucks and tractors.

Walter C. Keys has been appointed assistant director of engineering for the Standard Parts Co., with offices in Cleveland, Ohio. He was formerly with the spring department of the Cadillac Motor Car Co.

N. A. Wolcott, Charles Fillius and R. E. Gorton have been elected president, secretary and treasurer, respectively, of the Packard Electric Co., Warren, Ohio.

W. Donald Clark will market the auto spin flag in Michigan for the Wallace C. Hood Service Bureau.

John Lundhagen, J. H. Parvin and J. H. Hazelwood, of Fargo, N. D., Hutchinson, Kan., and Des Moines, Iowa, respectively, have been awarded the first, second and third prize offered in the sales letter contest of the Hyatt Roller Bearing Co., Chicago. The contest was open to the 15,000 salesmen and dealers of the company.

Tom O. Jones, recently appointed to foreign service on the United States foreign industrial research commission, as previously reported in THE COMMERCIAL VEHICLE, has sailed for Russia.

M. J. Schmucker, H. Cassel, Harold Conrad and Douglas Lansing are president, vice-president, secretary and treasurer, respectively, of the Scranton Motor Trades Assn. of Scranton, Pa., recently formed to promote good feeling and business co-operation among the motor men in that city. Mr. Schmucker is from the Ford organization in that city, Mr. Cassel from the Firestone branch, Mr. Conrad from the Lackawanna Automobile Co., and Mr. Lansing from the accessories department of the Lansing Hardware Co.

Moving Furniture in a Packard Truck for 350 miles was recently attempted by C. F. Van Sicklen, of the Van Sicklen Speedometer Corp. The Van Sicklen household goods were carried from St. Charles, Ill., to Detroit in a 3-ton Packard in 38 hours of actual running time.

India May Import Accessories which are to be used for genuine repair work and not for the purpose of assembling new cars. Motor vehicles and parts for assembly have been excluded from the country in accordance with the general restrictions throughout the empire.

"Transportation the Moreland Way" is a booklet published by the Moreland Motor Truck Co., Los Angeles, Cal., showing the possibilities of motor truck transportation and containing news items of the Moreland organization.

Trailmobiles Are Used in Cape Town, according to consular reports. A trailmobile made by an American house was exhibited in that city several months ago and twenty orders have resulted.

French Indo-China Needs Trucks, according to consular reports. An engineer in that territory is in the market for six or eight, 20 to 25 hp., 2½ to 3-ton trucks. Details may be had by inquiring at the Bureau of Foreign and Domestic Commerce, Washington, D. C.

"Service" is a pamphlet by R. E. Fulton, vice-president of the International Motor Co., New York, which outlines the type of service to be expected from the International organization.

Federated Malay States Have Prohibited the importation of motor vehicles except under special license.

Crescent Bulletin No. 104 has been issued by the Samuel L. Moore & Sons Corp., Elizabeth, N. J., showing the uses of the Crescent four-wheel-steered electric industrial truck. The pamphlet gives a detailed description of the truck together with the various uses to which it has been put by owners.

"Our Country Viewed from a Motor Truck" is a booklet by Mr. and Mrs. William Warwick showing how this couple crossed America in a G. M. C. truck. Their journey included both the northern and southern routes and a trip the length of the Pacific Coast. The booklet contains a number of photographs illustrating the various sorts of country to be found in the United States. The trip was previously described and illustrated in the October 1, 1916, issue of THE COMMERCIAL VEHICLE.

New Zealand Has Doubled Its Motor Vehicle purchases in the past 2 years. There are only a few trucks in use there at the present time, but the consular reports indicate that money is plentiful and the field good. The bulk of the imports are from Great Britain, which enjoys preferential duties, but the United States ranks second.

Malaga, Spain, Can Use Trucks when a sufficient demonstration is given in advance, according to consular reports. The war has opened up this part of Spain to American trade. The first American products sold here were inferior and, therefore, the buyers here have to be shown before purchasing.

"Your Storage Battery," Bulletin No. 107, is a pocket-sized booklet issued by the Willard Storage Battery Co., Cleveland, Ohio, showing the construction of a storage battery and giving instructions how to take care of them.

Two French Firms Want Motor Tractor catalogs. Details may be had from the Bureau of Foreign and Domestic Commerce, Washington, D. C.

China Is Adopting Motor Vehicles, according to Consul General Thomas Sammons, of Shanghai. A famous livery stable in that city is now affording garage service also.

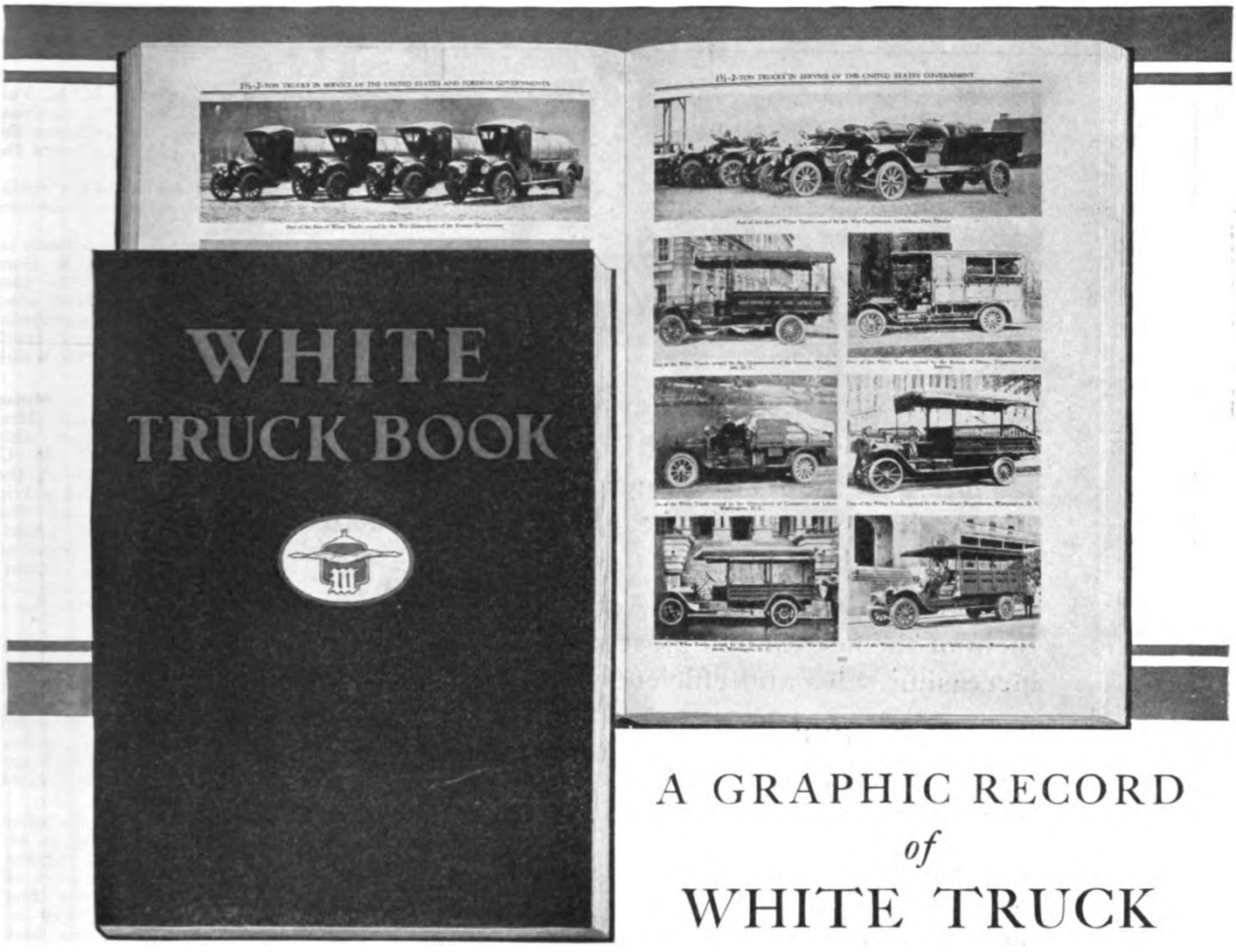
A British Guiana Company is in the market for low-powered gasoline or oil motor trucks for use on wharfs for transferring freight, to be used without tracks in the place of hand trucks, with a speed not to exceed 4 m.p.h. Details may be obtained by writing to the Bureau of Foreign and Domestic Commerce, Washington, D. C.

"Auto-Suggestions," June issue, is a booklet advertising the products of the Northwestern Chemical Co., Marietta, Ohio, including Norwesco rim and gasket cement, Carbonox for removing carbon and Se-Ment-Ol for mending radiators.

Jamaica Has 30 Trucks or less in service on the island, but has a large field for importations in this line, according to consular reports. There are over 800 passenger cars on the island and the trade is almost all with firms in the United States.

"Timken Magazine," May issue, is a handsomely illustrated periodical containing articles on truck upkeep, news of the Timken organization and advertising of Timken-Detroit axles and bearings.

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225 Pages—1400 Illustrations

THIS book will be sent gratis to any truck user if the request is made on his business letter head and signed by a responsible official.

White Trucks predominate in this country in total number of trucks in actual service—regardless of price.

A GRAPHIC RECORD *of* WHITE TRUCK PREDOMINANCE

THIS new White Truck Book is the largest and most comprehensive catalogue of truck installations in this country—virtually an official Handbook or Directory of truck uses in all lines of industry and commerce.

It illustrates over fourteen hundred separate truck units, with a wide variety of bodies classified and grouped for each line of business represented.

Body designs and equipment are shown for both standard and special uses, embracing the entire field of truck operation, from the massive dump body to the finest delivery vehicle.

THE WHITE COMPANY

856 EAST 79th STREET, CLEVELAND, OHIO

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The COMMERCIAL VEHICLE

THE editorial policy of COMMERCIAL VEHICLE interests the truck owner by keeping him advised of all new developments in the quest for the ultimate lowest-ton-mile-haulage.

It interests the Truck and Accessory Dealers by advising them of the newest and most valuable way and means for increasing sales and efficiently managing their business.

READERS

5,000 (plus) interested readers subscribers—read COMMERCIAL VEHICLE twice every month.

Most of them are just as much interested in the advertisements as in the editorial matter.

Truck Owners, Truck Dealers, Truck Salesmen, Truck Accessory Dealers and Jobbers are buying and reading it—more of them every issue.

CIRCULATION

This circulation is guaranteed—you **know** that the very people you want to reach will read your story. You have practically 100% of actual prospects.

COMMERCIAL VEHICLE is definitely and permanently established with the trade and offers a medium to advertisers in this particular field that is unexcelled.

It offers a dollar-for-dollar value that is extremely attractive to advertisers

The COMMERCIAL VEHICLE

239 West 39th Street New York

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Be Prepared

The motor vehicle industry, like all other manufacturing industries, will be burdened with a heavy war tax.

There will be extraordinary demands of all kinds made which will possibly affect the motor vehicle industry more than any other.

These abnormal conditions will affect dealer and manufacturer alike.

Now is the time **you** should ensure your business to meet these conditions.

You have the experience, the ability and the equipment to sell motor trucks.

Motor trucks will undoubtedly be in greater demand than ever before.

The Wilson Truck offers you great possibilities. Protect your investment—you will find the Wilson dealership very attractive and a wonderful protection.

J. C. Wilson Company
Detroit

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WEST'S CAST-STEEL WHEELS for MOTOR TRUCKS



"Patent Pending"

Are used by America's leading Truck Builders

These wheels were designed by, and are built under the supervision of, experienced engineers. They have been thoroughly tested and have proved they will stand hard usage and abuse.

Over 25,000 WEST'S CAST-STEEL WHEELS are now used on trucks and not one of them has failed to give satisfaction. Specify WEST'S CAST-STEEL WHEELS on every heavy truck you buy.

SATISFACTION GUARANTEED

The West Steel Casting Company

805-815 E. 70th St. Cleveland, Ohio

"Watch the West Cast-Steel Wheels Go Round"

GASOLINE TANKS and MUFFLERS

To maintain the high standard of your truck every part must be as well constructed as every other part.

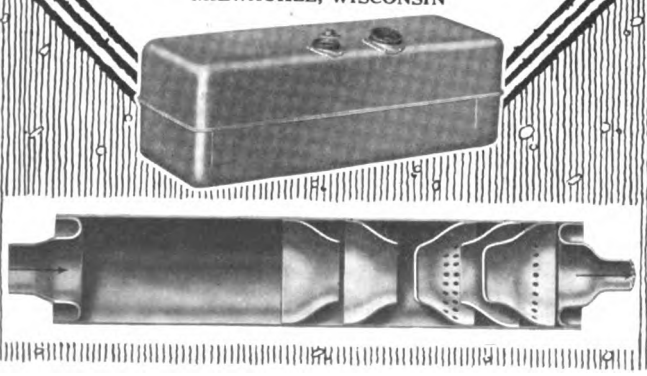
Many truck manufacturers, realizing this, have turned to

G.P.&F. SERVICE
"KNOWING HOW SINCE '81"

for their gasoline tanks and mufflers. These parts built to withstand hard trucking service, can be depended upon for quality. Built in a factory covering 15 acres of floor space, by skilled workmen who take pride in their work. 36 years of "knowing how" means sure protection to you in buying G. P. & F. products.

GEUDER, PAESCHKE & FREY CO.

1423-1700 St. Paul Ave.
MILWAUKEE, WISCONSIN



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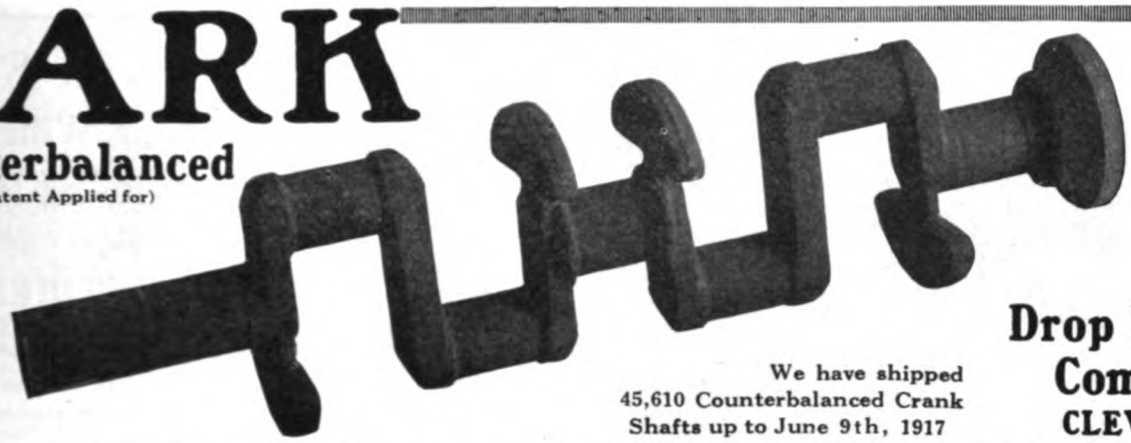
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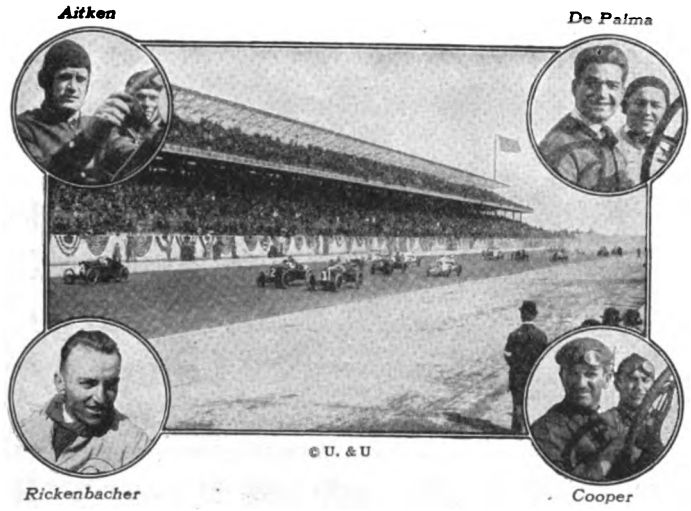


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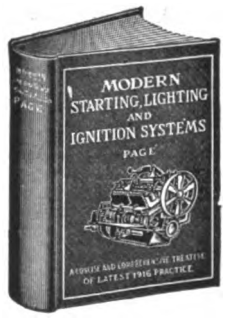
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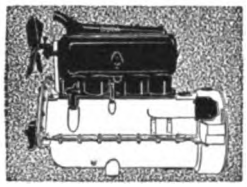
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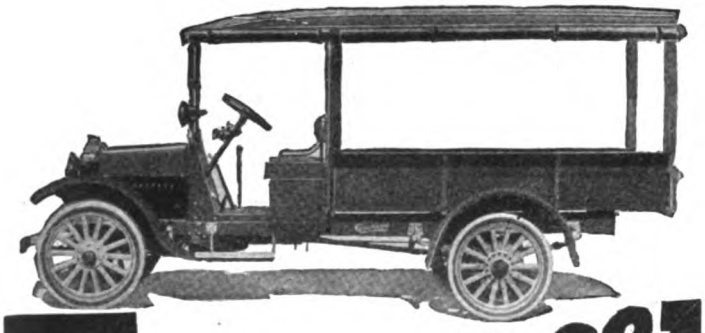
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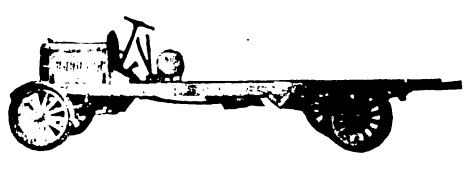
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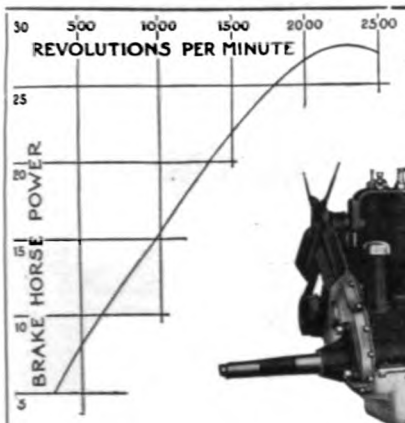
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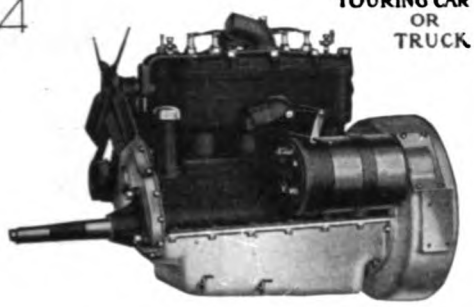
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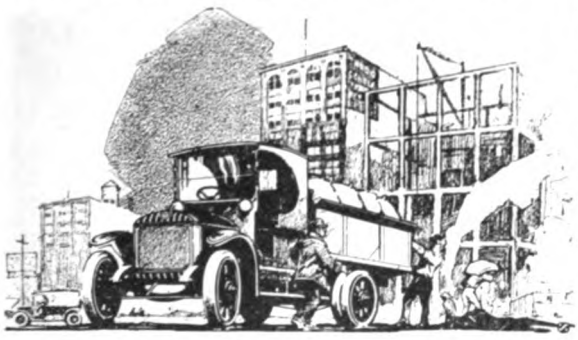
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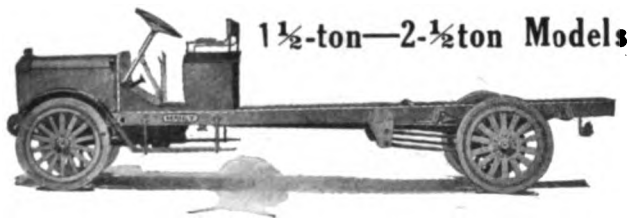
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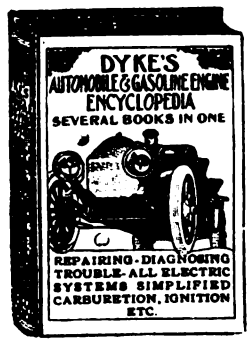
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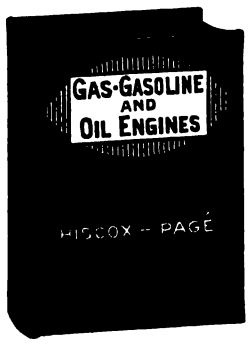
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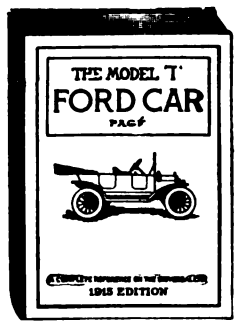
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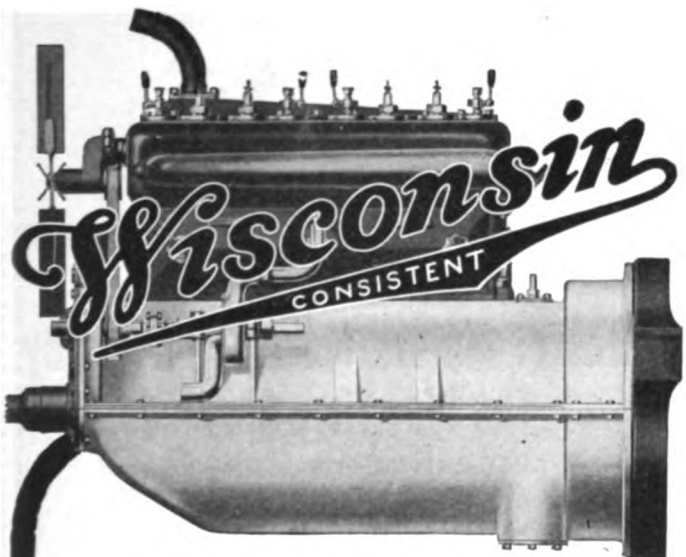
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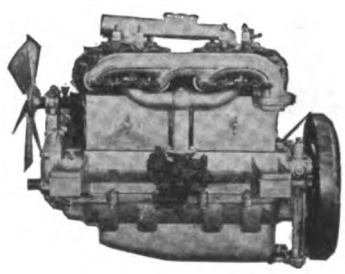
Unfavorable road conditions and lack of roads have often been offered as objections to the motor truck.

But the Duplex—the original 4-wheel drive truck—has overcome all such objections. It is hauling capacity loads—3½ tons—and pulling two or three trailers through sand, loam and hub-deep mud, and up grades and embankments where rear wheel drive trucks become stalled even when unloaded.

The Duplex is performing heavy haulage work more economically than any other truck built. The severest tests and most thorough demonstrations have conclusively proven this assertion time and again.

New factory buildings are being constructed by the Duplex Truck Company. Production is to be increased. As a result an opportunity is offered aggressive dealers to become distributors for this super-strength truck. Wire or write for our dealer proposition today. Address all communications to Dept. 107.

DUPLEX TRUCK COMPANY
LANSING MICHIGAN



Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications.

BEAVER MFG. COMPANY
Milwaukee Wisconsin

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Standard

MADE IN DETROIT USA

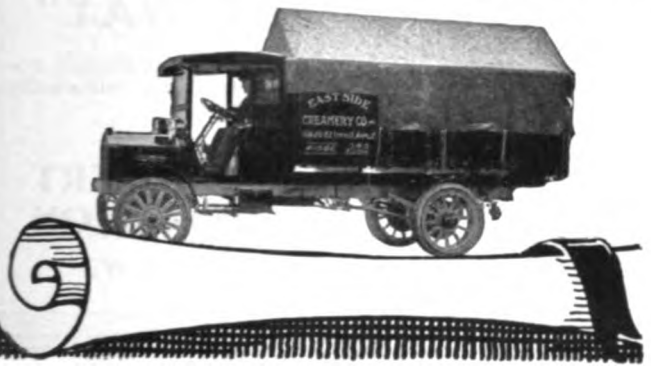
Motor Trucks

Reduce Transportation Costs For Your Customers

Standard Trucks incorporate in perfect balance units known the world over as the highest type of construction in their particular line.

They are daily solving the haulage problem for hundreds of concerns throughout the country. Responsible dealers looking for a high-grade line of trucks will find it worth while to investigate the standard.

Standard Motor Truck Co., Department 6. Detroit, Mich.



—Sheldon Springs—

Designing a truck presents no nicer problem than that of providing it with springs.

No concern in the world is as well prepared to solve this problem—none with the amount of experience—none with the varied experience—none with the facilities and equipment, either human or mechanical, that the Sheldon Axle and Spring Co. offers.

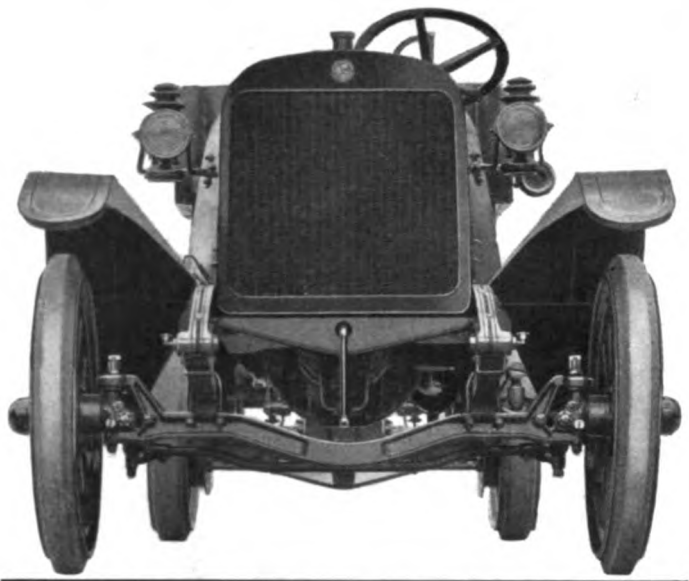
Collectively—these facts are the reason why the service Sheldon Springs will give is a known quantity and a guaranteed quantity.

SHELDON AXLE and SPRING COMPANY

Wilkes-Barre, Pa.

Makers of Springs and Axles for Heavy Duty Service for more than 50 years.

Chicago: 122 S. Michigan Blvd. **San Francisco:** 444 Market St. **Detroit:** 1215 Woodward Ave.



ACME THE TRUCK OF PROVED UNITS

Dealers Win By Our New Plan!

The Acme Plan of doing business means a new profit to the most alert truck dealer in each community. It's virtually a miracle plan which works wonders in the business of selling motor trucks.

How about your territory? Is it closed on the new Acme Plan? Has some keen competitor seized the opportunity the Acme Plan offers? We suggest that you write immediately or wire us, to know if your territory is still open.

Write for Free Truck Book

Every truck user and prospective user in your territory knows the dependable Acme Truck. Acme proved units such as Continental Motor, Timken Bearings, Timken Axles and Worm Drive, Detroit Springs, etc., are proof of Acme dependability.

Write for the free book, "A Pointer to Profits." It contains vital facts and figures.

Write for your copy today.

Cadillac Auto Truck Company

16 Mitchell Street **Cadillac, Mich.**

Cadillac Auto Truck Co.,
16 Mitchell Street,
Cadillac, Michigan.

USE THE COUPON

Please send complete information regarding your new business plan. It is understood that this request does not obligate me in any way.

Name .....

Address .....

Business .....

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WATSON TRAILERS and SEMI-TRAILERS



What's Between the Road and the Load?

JUST a trailer of limitations that *may* make good or a Watson Trailer or Semi-Trailer that *will* make good?

The Watson line knows *no* hauling job that it won't meet to absolute perfection —*no* tonnage requirement that it can't best answer—*no* haulage problem that it can't thoroughly master.

Whatever it is you *need*, Watson Platform Trailers, Semi-Trailers and Chassis for Special Bodies record one-thousandth per cent in performance and endurance.

DEALERS—These are times of *big* business. The Watson line is typical of the times. It offers profits and exclusive territory that put you in touch with the utmost expansion. Write ***TODAY*** for particulars.

Send for Watson Trailer and Semi-Trailer literature

WATSON WAGON COMPANY

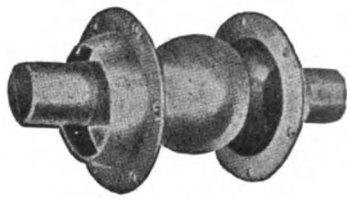
Largest Manufacturers of Bottom Dump Wagons in the World

45 Center Street, Canastota, N. Y.



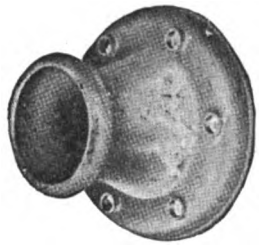
BOSSERT

In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice. We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, axle housings, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.



"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



THE BOSSERT CORPORATION

UTICA, N. Y.

ROSS GEARS

"The Steering Gears that Predominate on Motor Trucks"



Fore and Aft Steering Gear

Superior design, with enormous bearing surfaces, makes Ross Gears wonderfully easy to operate, with the highest degree of safety and reliability. Quality of materials and excellence of workmanship insure splendid service. Ross Gears are now in use on one hundred and twenty different makes of motor trucks.

Write for catalog and further information.

THE ROSS GEAR & TOOL CO.
750 Heath Street Lafayette, Indiana

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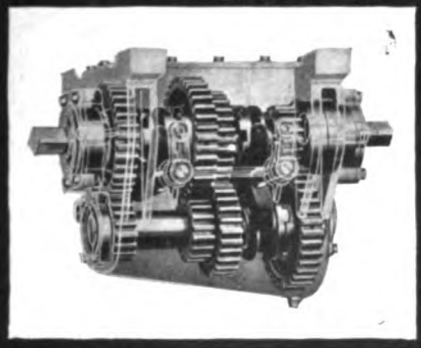
BROWN-LIPE

transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

BROWN-LIPE GEAR CO.
SYRACUSE, N. Y., U. S. A.
BROWN-LIPE CHAPIN CO.
Differentials Transmissions

NEW YORK—Thos. J. Wetzel, 29 West 42d St.
SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C.

COTTA TRANSMISSIONS



All Gears Always in Mesh

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.



International Motor Trucks Sold on a Business Basis

A MOTOR truck must either make a dollars and cents saving that will justify a business man in buying it, or it must bring him more business and greater profits. We offer the **International Motor Truck** on that basis.

The models for 1917 were designed to satisfy experienced truck users. That is why the **International** is different from every other truck—why the radiator is behind the engine—why the engine is so easy to get at—why it is built from motor to body in one factory—why we feel that we can recommend it without reserve to every business man.

Every experienced truck owner, for instance, wants a shaft drive rear axle, but he wants it with chain drive strength and lightness. A combination of the two types gives truck owners the best of all rear axle service—an axle consisting of two members, a single piece forging to carry the load and a live axle for transmitting the power. This combination gives the quietness and neatness of the shaft drive with the strength of the chain drive axle—just what experienced buyers want. When you make your decision on a motor truck, you cannot get too much information on this **International Motor Truck** feature.

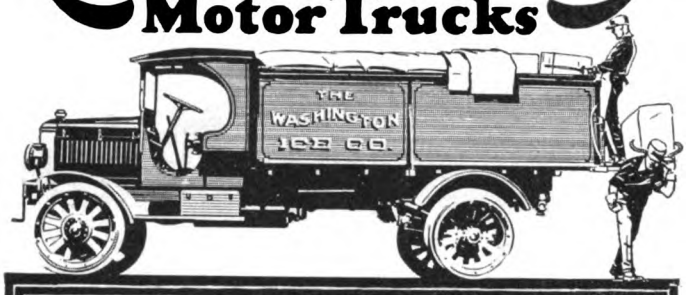
One of these sizes will meet your requirements: Model H chassis, 1500 lbs. capacity, $1225; Model F chassis, 2000 lbs. capacity, 128" wheelbase, $1500; Model F chassis, 146" wheelbase, $1550. Prices cash f.o.b. factory. (Prices subject to change without notice.) Write us for convincing folders that make every point clear.

International Harvester Company of America (Incorporated)

88 Harvester Building Chicago, U. S. A.

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ARMLEDER
Motor Trucks



Sales Are Coming Fast for Armleder Dealers

Sales never came so fast or so easily for Armleder dealers as they are coming now.

The dealers never made more money.

The reason is not only that Armleder trucks sell readily, or that they make good in service and bring repeat orders. This dealer prosperity is also due to the fact that the dealers can get the trucks.

When an order is taken it is filled promptly as shipping conditions permit.

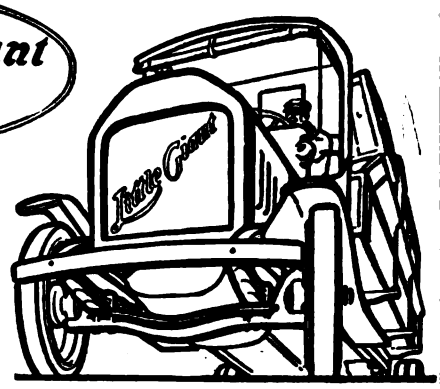
Dealers within 500 miles of the factory have driven dozens of trucks over the roads to fill rush orders.

The new Armleder dealer begins with a running start. Your territory may be open.

Two-Ton *Worm-Drive*
Three-and-a-half-Ton

The O. Armleder Co.
Twelfth, Plum & Charles Sts.
Cincinnati, Ohio

Little Giant Trucks



For the right man, the Little Giant line means larger profits. From the Convert-a-Car (Ford truck unit) to the 3½-ton truck, 11,000 have delivered better, for less—some for over nine years. 23 years of mechanical and engineering experience are behind and builded into this truck. That's why it is so absolutely guaranteed. A new exclusive selling feature is the Hydro-Pneumatic Gas Generator, which cuts fuel costs in two. Learn our plan for helping you sell—definite advertising of *you* in *your* territory.

Write today for particulars.

Chicago Pneumatic Tool Co.
615 Little Giant Bldg., Chicago, Ill.
Branches and Service Stations Everywhere

PIERCE Governors



Guarantee Motor Truck Efficiency

Owners of motor trucks are learning from experience that the only proper way to judge any truck is to take into consideration cost of upkeep, cost of operation, and performance—three features which are vitally dependent upon the governor. A thoroughly reliable governor will eliminate 75% of the usual repairs, reduce consumption of gas and oil, and keep the truck always ready to do the owner's bidding.

One Truck on the Job Is Worth Ten in the Repair Shop

The Pierce Governor, through its automatic and perfect control of the motor, prevents the troubles that put trucks in the repair shop. Supplies just the right amount of vapor to the motor, permitting the driver to get full power at all speeds up to the danger point, and shuts off the power when that point has been reached.

Can be adjusted for any desired speed.

Used by 57 Prominent Truck Manufacturers
Demand a Pierce Governor on the truck you buy

PIERCE GOVERNOR COMPANY
World's Largest Governor Builders.
ANDERSON, INDIANA, U.S.A.

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The GLOBE Truck
The Motor Truck PLUS



Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

Globe Motor Truck Co.
721 Wright Bldg. St. Louis, Mo.



Who Got the Jump in Magneto Making?

The first strictly high-tension magneto was an Eisemann. It was designed and built sixteen years ago.

The lead which the EISEMANN assumed then never has been relinquished.

Judge how firmly this magneto has held its leadership by the quality of the motor trucks whose makers use the EISEMANN as standard equipment. The list of 75 includes Federal, G. M. C., Gramm-Bernstein, Kelly, Pierce-Arrow, Service, Sterling and White.

Truck service, better than anything else, reveals the difference between magnetos. Eisemann superiority is positive and clearly demonstrable.

THE EISEMANN MAGNETO CO.
Sales & Gen'l Offices: 32-33rd St., Brooklyn, N. Y.
Chicago Ill., 910 So. Michigan Avenue
Detroit, Mich., 802 Woodward Avenue

EISEMANN MAGNETO

VENUS 10¢ PENCIL



FOR drafting and designing especially, the BEST pencils are none too good. This explains the great popularity of VENUS PERFECT PENCILS. The 17 degrees from 6B softest to 9H hardest satisfy every technical requirement.

Use 6B-5B-4B-3B for bold, heavy lines.

Use 2B-B-HB-F-H-2H for general work and sketching.

Use 7H-8H-9H for delicate, thin lines, maps, charts, etc.

VENUS ERASER *Superfine Quality* *Rubs out Cleanly and Easily*
Will not soil or streak. 12 SIZES, FROM 100 TO BOX, TO 4 TO BOX. BOX PRICE $2.00

FREE!

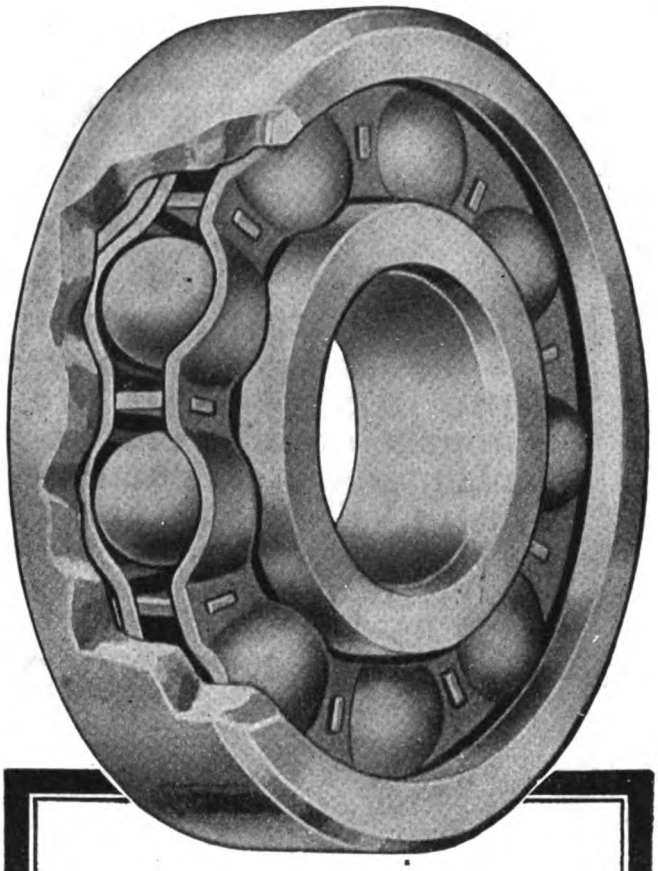


This test box of VENUS drawing pencils, VENUS copying pencil and VENUS eraser Free. Write for this *today*.

American Lead Pencil Co.
247 Fifth Avenue, New York
and Clapton, London, Eng.

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THE New Departure may not be the only ball bearing which gives satisfactory service in the highest types of automobiles, but there is a reason why **more** New Departure ball bearings than any other are used in American motor cars.

The reason why the demands for New Departures have persistently increased, so that this company is the largest manufacturer of ball bearings in the whole world, can be summed up in one word—quality.

The New Departure Manufacturing Co.

Conrad Patent Licensee

Bristol, Conn. Ford Bldg., Detroit

NEW DEPARTURE BALL BEARINGS

1000 Pound Capacity

Sheridan Commercial Car

Ready for Delivery Now

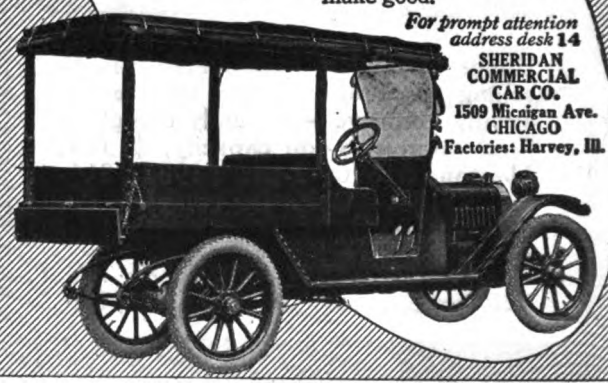
Fully Equipped Price $540

THE SHERIDAN is the lowest priced delivery car on the market. Thoroughly equipped and properly built to do the work it's designed for—haul 1000 pounds any time—anywhere. Ample in size, load capacity and power.

Sells fast to a big, ready-made field of *buyers*. Not a rebuilt pleasure car. Made a truck through and through by manufacturers of trucks, to replace horses where price is what counts. Chassis alone, **$490.** Fully equipped, **$540.** Write or wire for complete details. Make territorial reservations now. Dealers make good.

For prompt attention address desk **14**

SHERIDAN COMMERCIAL CAR CO.
1509 Michigan Ave. CHICAGO
Factories: Harvey, Ill.



GMC
GENERAL MOTORS COMPANY
TRUCKS

This trade mark stands for a complete line of trucks *built in worm and chain drive* to meet the varied demands of city and country work—a truck to fit your business.

Send for catalogues today

GENERAL MOTORS TRUCK COMPANY
One of the Units of General Motors Co.
Pontiac, Michigan

Branches and Distributors in principal cities (84)

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FULLER
Unit Power
TRANSMISSIONS

Give your customers a guarantee of satisfaction in their clutch and transmission by using only the best. FULLER transmission is approaching as rapidly as possible an ideal of perfection, of 100% efficiency of continuous service day in and day out, of no repair expense, no trouble, no lay up and no lost time. It's an ideal worth working for and an ever-increasing list of customers gives us the satisfaction of knowing we are approaching that Ideal.

Look for the name FULLER.



Eastern Representatives
EARLE & BOGGS
1790 Broadway, N. Y. C.

FULLER & SONS MFG. CO.
Kalamazoo, Mich.

STEGEMAN 6 (SIX CYLINDER) TRUCKS

THE MASTER TRUCK



In the Stegeman Six-Cylinder Auto Truck

the dead load does not bear on any part of the driving mechanism. The continuous, overlapping power from the Six Cylinder Motor flows in a smooth, undiminished stream to the driving wheel.

Sizes—2, 3, 4, 5 and 7 ton

Electric starter and lights included in standard equipment.

Features

Continental 6-cyl. Motor. David Brown full floating Worm Drive Rear Axle. Brown Lipe Transmission and Multiple Dry Disc Clutch. Westinghouse Electric Self-Starter, Generator and Bosch Magneto. Write for Agency Proposition.

Stegeman Motor Car Co. Milwaukee



Cut the loss out of your delivery cost

When you know your actual truck mileage, you can get at the heart of your delivery cost. You can check your expense for tires, gasoline, oil and repairs against mileage. This will enable you to get the most from your vehicles and estimate accurately your present and future delivery requirements. There is one best way to do it—the

DREADNAUGHT *Indestructible* Hub Odometer
TRADE-MARK

It gives accurate, continuous mileage records. It's easy to read, dust-proof and grease-proof. The figures are always right-side up. It is the only indestructible hub odometer—a new one free if you break it, no matter how.

A few well known concerns who use the Dreadnaught Hub Odometer

New York Telephone Company, Gulf Refining Company, New York Board of Fire Underwriters, United States Army Ambulance, Wells Fargo Express Company, Western Electric Company, Pacific Telephone Company, American Can Company, Armour & Company, Fisk Rubber Company, Standard Oil Company, Edison Electric Illumination Company, Loose-Wiles Biscuit Company, The Barrett Company, H. J. Heinz Company, New England Tel. & Tel. Company.



We guarantee its accuracy and long life. Aren't you willing to try it?

Send for full information and descriptive catalogue

AMERICAN TAXIMETER COMPANY
Mfrs. of Jones & Popp Taximeters
1765 Broadway New York City

SERVICE STATIONS IN THE FOLLOWING CITIES
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THE MARK OF A BETTER RADIATOR

G & O Radiators for Heavy Duty Service

The G & O Mfg. Co.
New Haven Connecticut

The "Baby Wood"



Hydraulic Hoist—
TYPE "E"

just as good a servant for the small dump truck,

as Father Type "D" Heavy Duty is for the Big Dump Truck, and Mother Type "C" was for the middle-size Dump Truck.

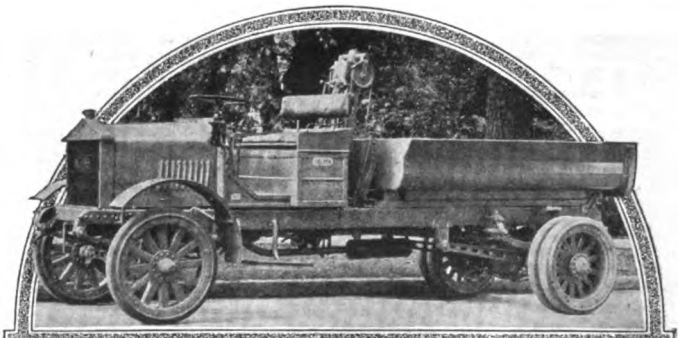
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—the lightest,
—the simplest,
—the most positive,
—the quickest-working and most easily installed Dumping Device made.

Made to fit any chassis.

Sole Manufacturers

Wood Hydraulic Hoist & Body Co.
New York DETROIT Chicago



Selden Trucks

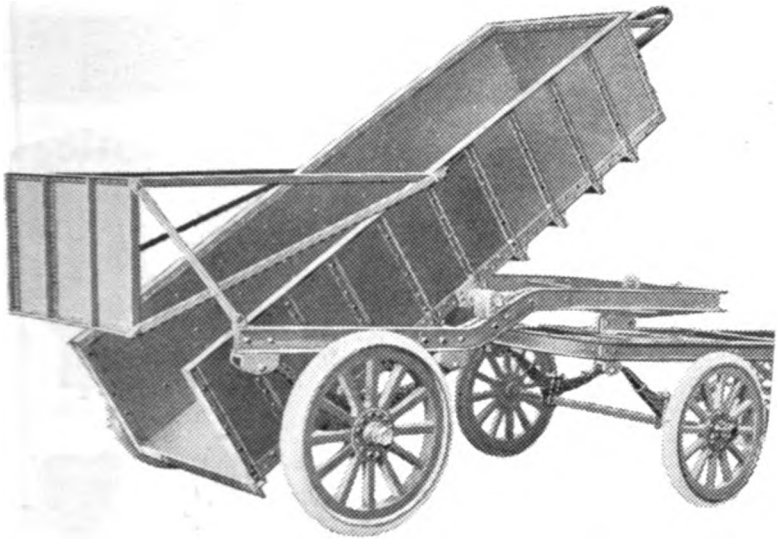
"Not in Repair Shop Once in 3 Years"

A lumber concern in Troy, N. Y., after having operated a Selden Truck for three years reports that "during all that time, notwithstanding that the truck was given the hardest kind of usage, it was never in the shop for repairs, except for a few minor replacements."

DEALERS: Consider the satisfied customers the Selden Line would make for you. Big sales! Big profits! A minimum of repair work! Apply for territory. BE QUICK!

Selden Truck Sales Co.
Rochester, N. Y., U. S. A.

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MR. DEALER

You Can Make Big Money If You Sell

Rogers Brothers All-Steel TRAILERS

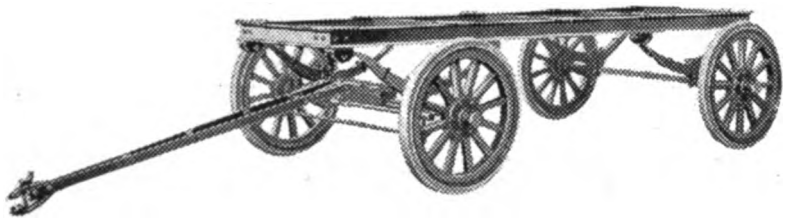
THE MOST EXTENSIVE AND BEST LINE OF TRAILERS MADE TODAY

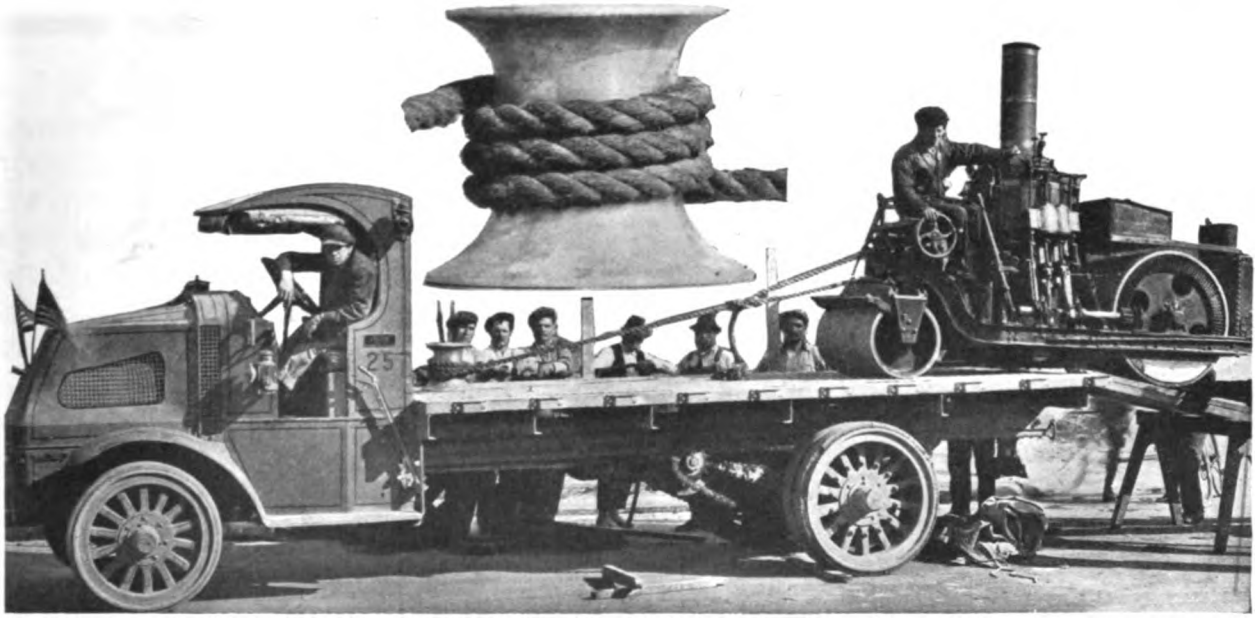
TWENTY-SEVEN MODELS

Made in Every Type, Size and Capacity ***For Every Purpose***

Rogers Brothers Company
Albion, Pa.

ROGERS BROTHERS COMPANY
Of NEW YORK
Eastern Distributors and Exporters
50 EAST 42d STREET NEW YORK





A TRUCK WINCH THAT'S SAFE

It's the Mead-Morrison, a special patented device that is being used with great success by general truck firms, electric light and power companies, furniture movers, grain dealers, contractors and other concerns who make it a business to hoist heavy units, in addition to hauling them.

The installation of the Mead-Morrison Patent Truck Winch is extremely simple. It not only cuts hauling and hoisting costs to a minimum but it also is used for hauling the truck itself out of mud holes and ditches. And above all, it is a safe winch.

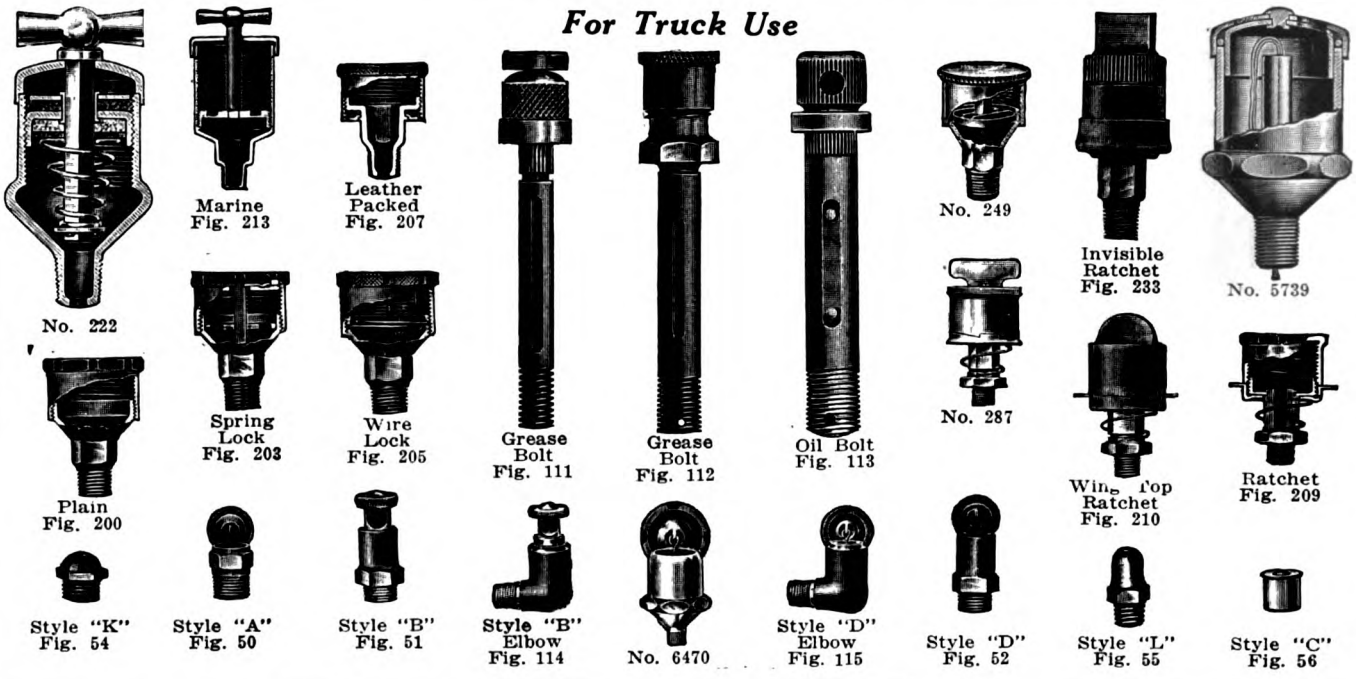
Capacity, single line 3500 lbs. at rope speed of 60 feet per minute. Space required, 22 inches square. Fitted with automatic brake, making it SAFE AT ALL TIMES. Write for particulars.

MEAD-MORRISON MFG. CO. EAST BOSTON, MASSACHUSETTS

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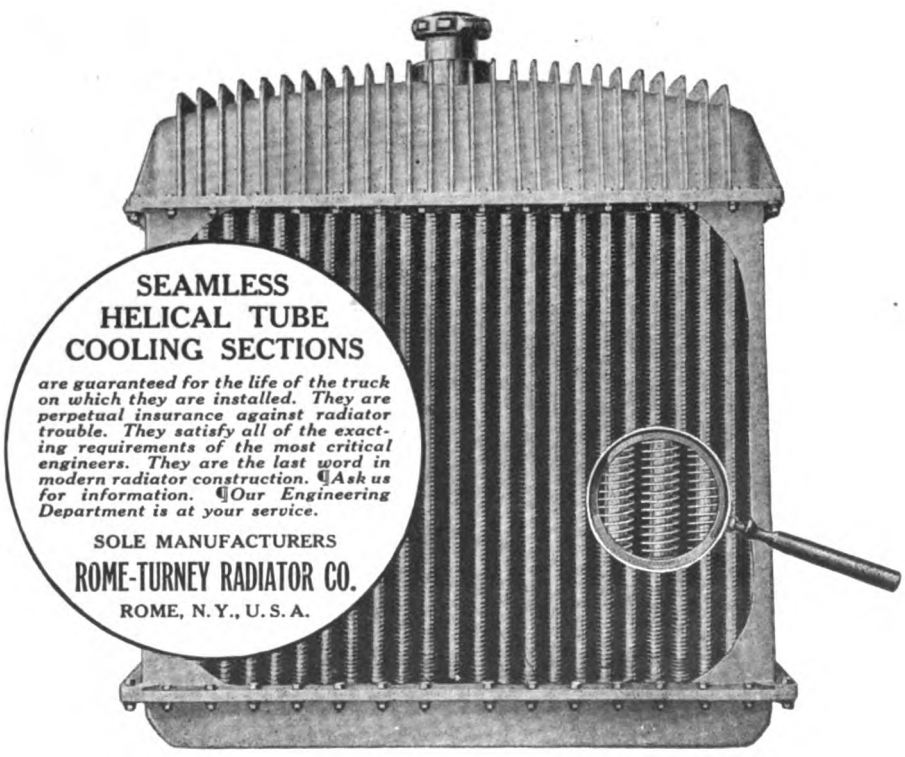
EMPRESS
OIL AND GREASE CUPS

For Truck Use



BOWEN MFG. CO.
AUBURN, NEW YORK

SEND FOR CATALOGUE "A"



SEAMLESS HELICAL TUBE COOLING SECTIONS

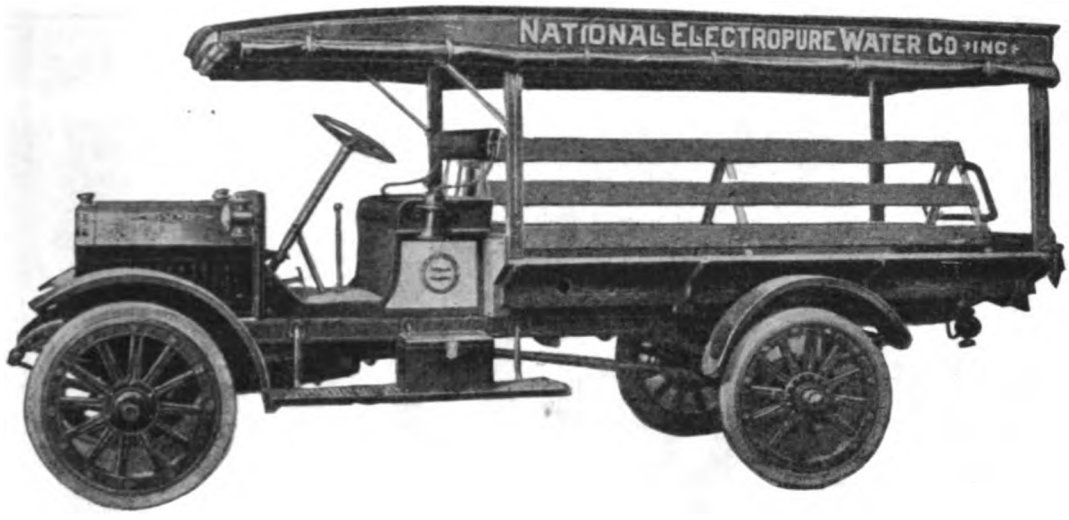
are guaranteed for the life of the truck on which they are installed. They are perpetual insurance against radiator trouble. They satisfy all of the exacting requirements of the most critical engineers. They are the last word in modern radiator construction. ¶Ask us for information. ¶Our Engineering Department is at your service.

SOLE MANUFACTURERS

ROME-TURNEY RADIATOR CO.

ROME, N. Y., U. S. A.

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Performance Not Theory is What Made Bessemer Success

Whether used for the delivery of pins or pianos, Bessemer Motor Trucks have always demonstrated the utmost dependability and all 'round satisfaction.

The term "flexibility of service" was never more accurately applied to a truck than it is to the Bessemer. It is master product made by men who know transportation needs and the quality of truck necessary to fill them. And in performance it makes good all the things said about it in print.

The reason is simple—quality. Quality of materials and workmanship—backed of course by an institution with ideals rather than a desire for profits without regard to the good will of the customer. Buyers—here is a truck that is fundamentally sound in every respect—a truck that contains all the good points without a single weakness. Dealers—here is the one opportunity many of you have been waiting for—an opportunity to be up with a concern that has the goods and the gumption to help you to bigger and better profits.

Model G—1-Ton Internal Gear Drive $1250

Model J—2-Ton Internal Gear Drive $1985

Model D—2-Ton Worm Drive $2200

Model E—3½-Ton Worm Drive $3100

Bessemer Motor Truck Company, Grove City, Pa.

Metropolitan Motor Co. Minneapolis, Minn.
Distributors for Middle North-West

The Bessemer Truck Co. Buffalo, N. Y.
Distributors for Western New York State

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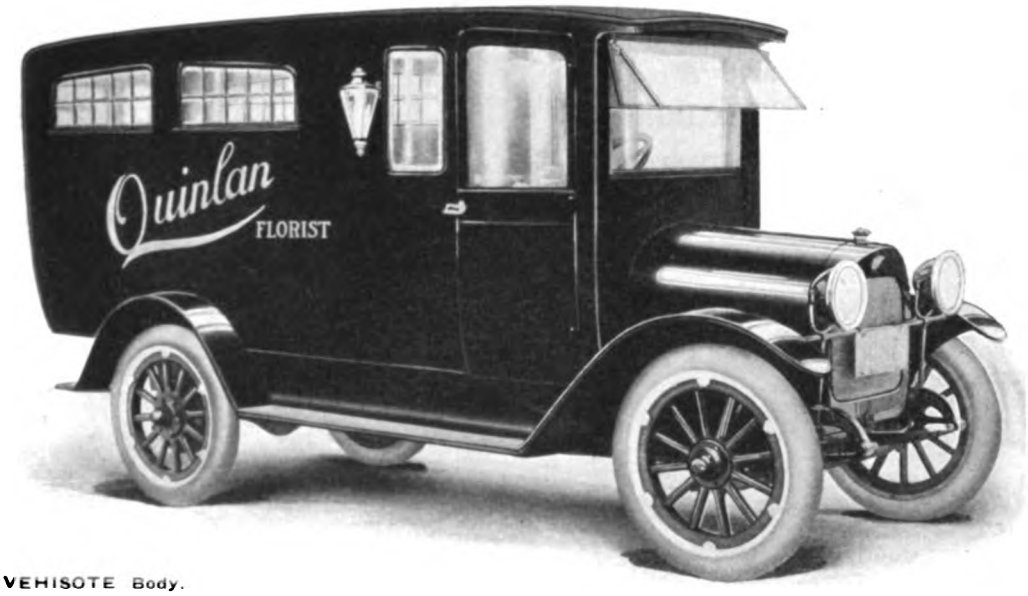
VEHISOTE

Has No Grain No Laminations

Side panels consist of one large sheet of VEHISOTE—crackless—jointless—flowless. The checking and blistering, the gaping seams, which are so unavoidable in wooden panels, are impossible with this impervious, one-piece material.

VEHISOTE is waterproof, impervious to climatic conditions, takes and holds paint equal to wood, can be given a very beautiful finish and grows stronger with age.

VEHISOTE is not a substitute for wood in vehicle body building. It is a scientific and positive improvement over wood or any other material for the purpose.



VEHISOTE Body.
Built by August Schubert Wagon Company, Oneida, N. Y.

THE PANTASOTE COMPANY

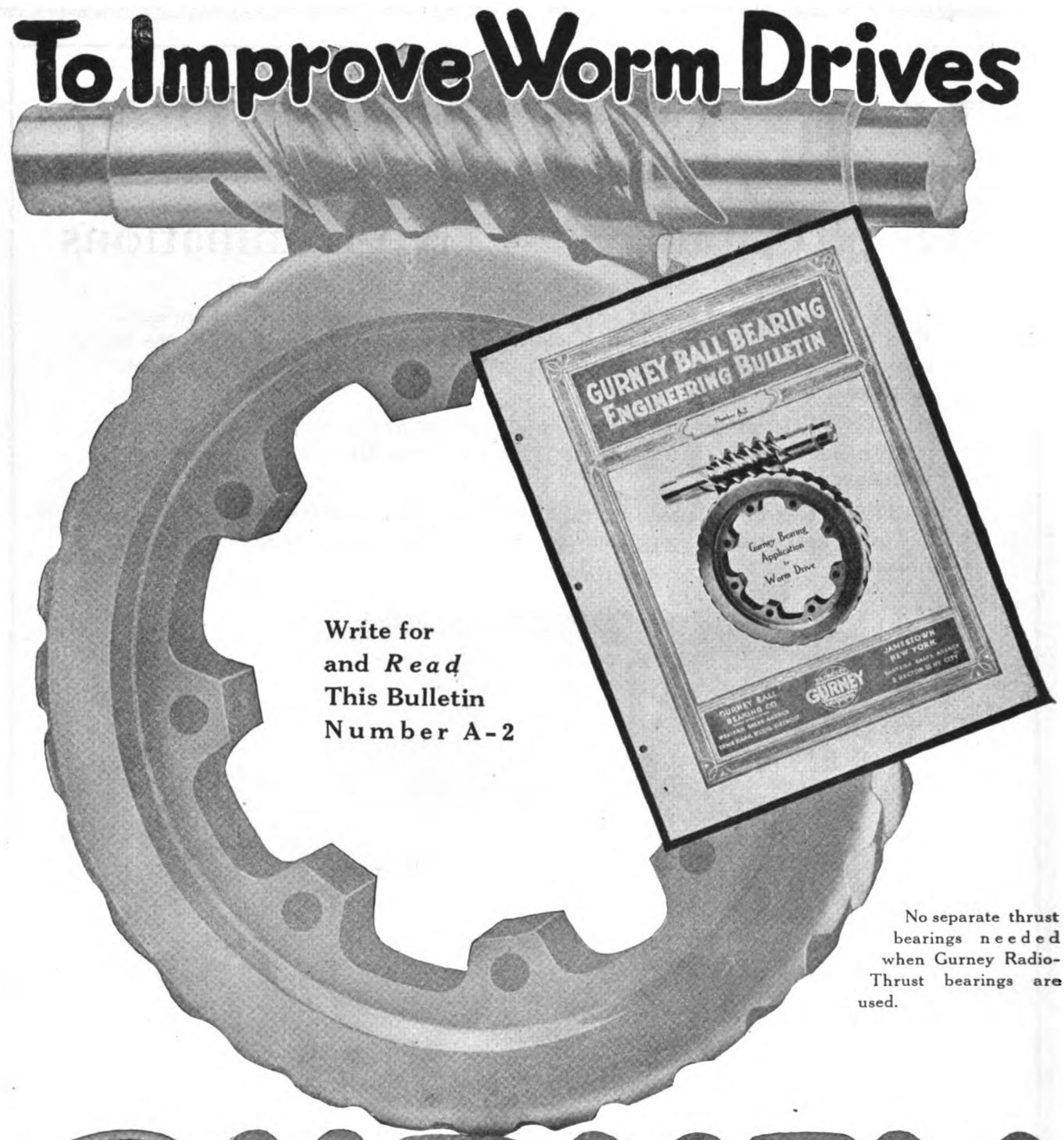
11 Broadway, New York People's Gas Bldg., Chicago

JOBBERS

Scovel Iron Store Co.
San Francisco, Cal.
Gerhab & Ludlam
Philadelphia, Pa.
C. H. Tiebout & Sons
Brooklyn, N. Y.
Wm. E. Kleine & Co.
New York City
E. C. Kadow & Co.
Chicago, Ill.
W. T. Crane Cge. Hdwe. Co.
Newark, N. J.
Mossman-Yarnelle & Co.
Fort Wayne, Ind.
Sligo Iron Store Co.
St. Louis, Mo.
H. D. Taylor & Co.
Buffalo, N. Y.
N. Langler & Sons
Brooklyn, N. Y.
H. Hett & Sons
New York City
Haury Hardware Co.
Cleveland, Ohio
John C. Hills
Trenton, N. J.
Wm. Stockhoff
Louisville, Ky.

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To Improve Worm Drives



Write for and *Read* This Bulletin Number A-2

No separate thrust bearings needed when Gurney Radio-Thrust bearings are used.

GURNEY

GURNEY BALL BEARING CO.

Conrad Patent Licensee

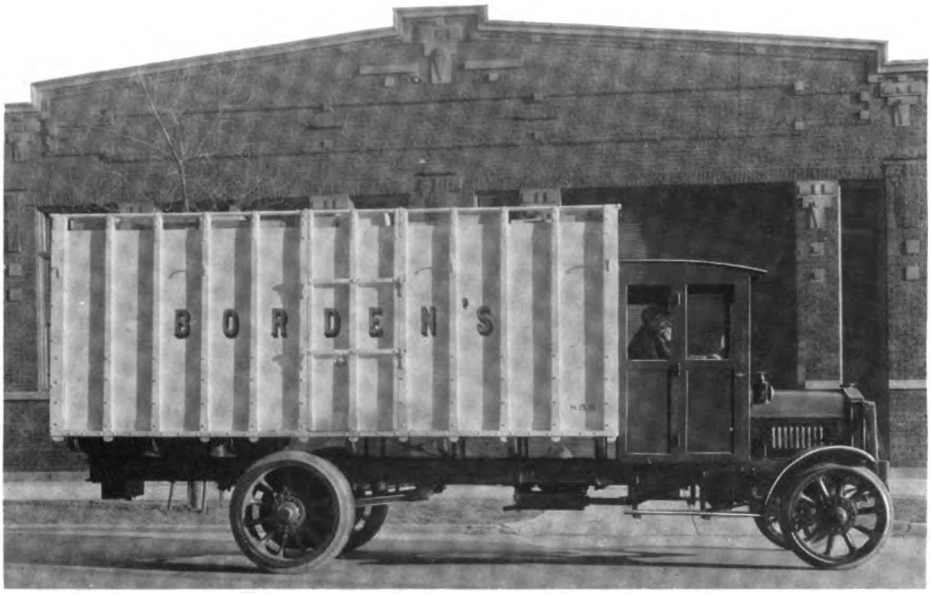
Chicago, Ill. Jamestown, N. Y. New York City

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These Are All the Latest FEDERAL Models

FEDERALS were never in so great demand the country over as they are today—

The three trucks at the top of this page are recent sales—

The big FEDERAL at the left in service of Borden Milk Company is one of a big fleet. It runs night and day—and is making a great record for economy of gasoline.



An Ann Arbor, Michigan, Contractor Operates FEDERALS



A Big Detroit Bakery Has a Fleet of These

Hunting a Better Market for Produce

THIS is the story of a man's saving three hours sleep each night, and hunting a market which brings better returns on the product of toil.

Thomas D. Coleman, Cohoes, N. Y., writing for the "Market Grower's Journal" tells a very interesting story on the work accomplished by his one and one-half ton FEDERAL truck which he purchased in March, 1916.

Mr. Coleman is a market gardener, and has one of the best farms in the Scherluyn Valley.

He has named his farm the "Scherluyn Creek Farm" and his natural market is at Schenectady. However, having a truck, he is not limited to a small radius, and therefore has the advantage of other good markets.

Mr. Coleman says, "I will give you some idea of the benefits my truck affords:

"I am ten miles from Schenectady market where I usually take my produce. When I drove horses it would take me four hours from the time of rising before I would reach the market with a heavy load. Now with the FEDERAL I rise three hours later, and reach the market earlier than with horses. The same time of course is saved on the return trip, and I do not have to wait before returning as I used to with the horses, as I was obliged to put them up, and feed them, before starting for home.

"Since purchasing the truck I am able to be at home in the morning to direct my men in their work so you can see that the FEDERAL is a time and labor saver in more ways than one.

"Here is one instance which shows the value of motor haulage in my business; this occurred last summer in the height of the tomato season. I had the truck loaded with 100 bushels of tomatoes, 1,000 ears of sweet corn, 6 bushels of peppers, and 6 bushels of lettuce.

Truck Saves $55 in One Day

"On arriving at the Schenectady market I found that it was overloaded with tomatoes; therefore, I decided to go to another place to dispose of them, so I drove the truck to Amsterdam, N. Y., a distance of 17 miles, arriving there at 5.50 o'clock. It took 1 hour and 10 minutes to make this trip and I found that here the market was not over-stocked on tomatoes.

"I sold the whole load readily, receiving an average of 75c per bushel for them. On the return trip I inquired from a neighbor how much he received for his tomatoes at Schenectady and found that he had received 20c per bushel for his 40 bushels, or 55c per bushel less than I, so I made up my mind that the 17 mile trip was well worth the difference.

"We also use our truck for hauling fertilizer, taking 2 hours and 30 minutes for the round trip against 7 hours with the old horse equipment.

"Another use to which we put our truck is the hauling of passengers to and from church on Sunday, and that is why we had a combination body made, and as shown in the picture is arranged for passengers."



This FEDERAL Saved Mr. Coleman $55 in One Day—and Saves Him 3 Hours Sleep Every Night

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R. J. Martin, FEDERAL Prize Winner Makes His Truck Work Overtime

"I HAVE made 15 night drives after working truck all day at my regular work. My night drives have been from 20 to 60 miles. I work my truck every Sunday.

"I started in one week to see how much work I could get out of the truck. On Monday I worked truck up to 6 o'clock on regular work. Then loaded for Chillicothe, a town 25 miles, or 50 miles round trip. Got home at 2 A. M. Tuesday I was out at 6:30 A. M. Worked until 5:30, loaded and made a trip to Chillicothe. Wednesday morning I was out at 6:30 and worked until 5 P. M. Loaded again for Chillicothe. After a continuous run of 20 hours per day for 3 days the truck was O. K., but I was all in."

Mr. Martin has been doing some wonderful work with his 1½ ton FEDERAL, No. 3931. It was delivered January 22nd, 1916, and put into service February 10th, but he did not install an odometer until June 1st. From June 1st to December 31st he drove the truck 4694 miles—losing but 3 days in June and 3 in November. The exceptional service he has given with this truck on double duty has more than made up for the six days lost.



R. J Martin's FEDERAL With a Full Load

Mr. Martin gives us the following figures as the total cost of operating his truck from June 1st to December 31st.

Gasoline—810 gallons	$140 54
Lubricating oil	5 25
Cup grease	50
Gear and differential lubricants	1 50
Repairs	16 50
Presto-gas	7 50
Total cost	$171 79
Cost per mile	$ 0366
Miles per gallon of gasoline	5.8

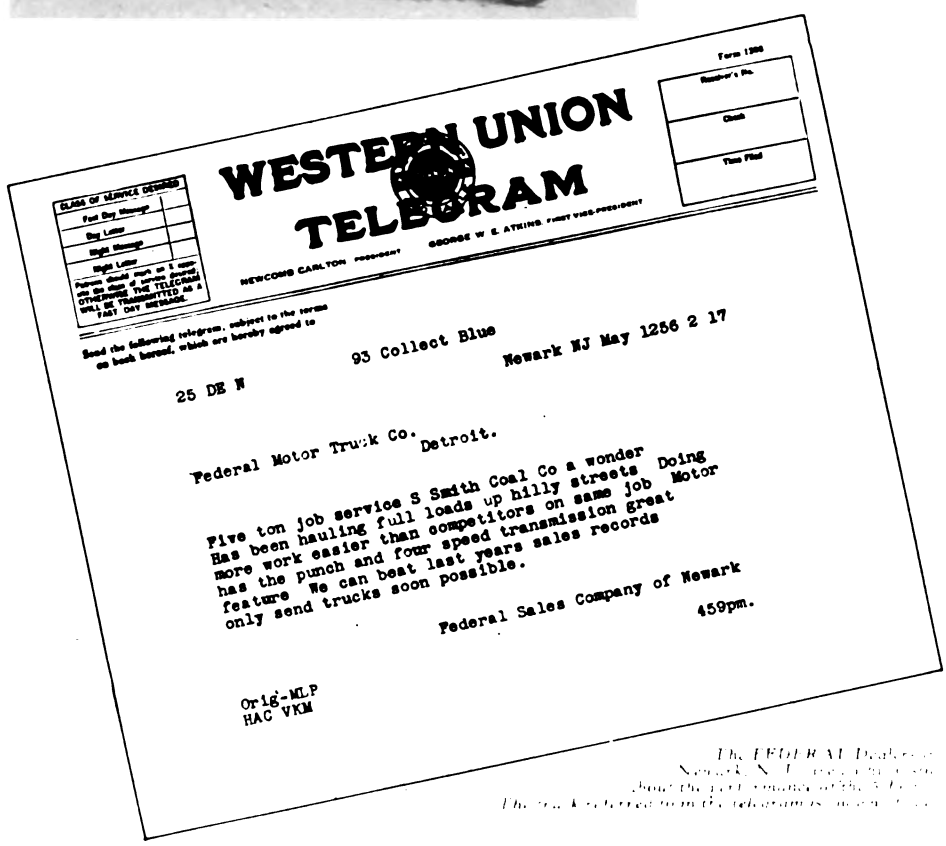
R. J. Martin was second prize winner in our Horse Cost Contest as announced in our last issue. His opinions regarding trucks and horses are interesting.

"Before using my truck I used one team every Sunday. Since the team required hay, corn and water, as well as care, it really costs as much to keep them on Sunday as it does on work days. Now I do all Sunday and night work with the truck, as I can do it in the time it would take to curry and harness a team."





These photographs show some of the present production of FEDERAL Models in the Service of Some of the Firms who Believe in FEDERAL Efficiency



WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT — GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

CLASS OF SERVICE DESIRED
Fast Day Message
Day Letter
Night Message
Night Letter
Patrons should mark an X opposite the class of service desired; OTHERWISE THE TELEGRAM WILL BE TRANSMITTED AS A FAST DAY MESSAGE.

Form 1256
Number's No.
Check
Time Filed

Send the following telegram, subject to the terms on back hereof, which are hereby agreed to

93 Collect Blue
Newark NJ May 1256 2 17

25 DE N

Federal Motor Truck Co. Detroit.

Five ton job service S Smith Coal Co a wonder Has been hauling full loads up hilly streets Doing more work easier than competitors on same job Motor has the punch and four speed transmission great feature We can beat last years sales records only send trucks soon possible.

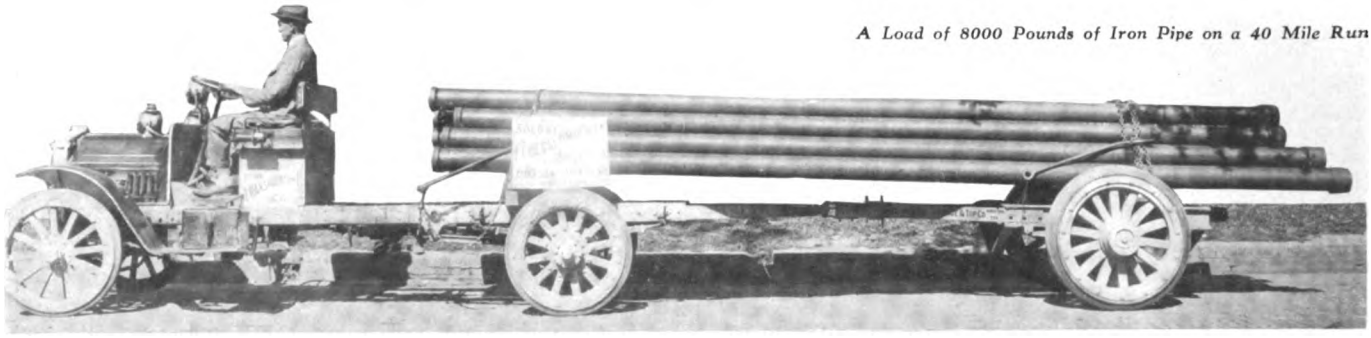
Federal Sales Company of Newark
459pm.

Orig-MLP
HAC VKM

The FEDERAL Dealer of Newark, N. J. [illegible] about the [illegible] of this [illegible] The [illegible] to the telegram's [illegible]

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A Load of 8000 Pounds of Iron Pipe on a 40 Mile Run



Moving Big, Bulky Loads With Tractor and Trailer

Big Oil Company in Southwest Demonstrates Efficiency of This Phase of Motor Haulage

THERE are practically no insurmountable problems in heavy load hauling now-a-days.

In the early days of mechanical haulage extreme bulk or weight of the material to be moved often rendered it impossible to haul by trucks.

With the development of "motor trains" and the building of strong units to attach to the motor trucks as trailers, the weight and size of loads have been increased until today there is hardly any limit to the possibilities of "moving by motor."

The demand for strong tractor units has so increased that the FEDERAL Motor Truck Company and many other manufacturers are now building tractors equipped with rocking fifth wheels and draw bars for hauling trailers.

This year the FEDERAL Motor Truck Company are producing 2 tractor models, to be used with semi or four wheel trailers for light and heavy duty of 6,000 and 14,000 pounds capacity respectively. These models are equipped with special Martin-FEDERAL fifth wheel and FEDERAL spring draw-bars.

Ordinarily in this publication we do not mention particular models only in the stories of their performance as reported by their owners. This statement is made, therefore, only because of the increasing interest in trailer equipment with trucks.

The Star Transportation Fleet

We show in picture herewith the FEDERALS in which heavy loads are hauled long distances on trailer equipped FEDERALS, in the fleet owned by the Star Transportation Company, of Houston, Texas, which is a sister company to the Gulf Coast Oil Company.

The first picture shows a Model M FEDERAL and trailer loaded with 8,000 pounds of iron pipe. This load was hauled from Houston, Texas, to Goose Creek, Texas, about 40 miles run over an excellent shell road most of the way, excepting about 4 miles of sand and dirt through a wooded district. In this latter stretch it was difficult to avoid the stumps and a driver had to pick practically his own road.



No. 3—Showing the Star Fleet en route

The round trip was made in one-half day, returning empty. No difficulty was experienced at any time on the trip.

The next picture, No. 2, shows one of the Star Transportation fleet with trailer loaded with a big 45 horse power special steam boiler weighing 13,500 pounds.

The country in which the Star fleet operates is known as the oil country, and regular trips are made from Humble to Goose Creek, Texas, where the wells are located, a distance of 65 miles, and in the instance of the boiler load this trip was made in 4 hours even.

In fact, a number of these same boilers have been hauled over this route, and with the equipment shown in the picture, without difficulty.

The trailers are equipped with the very best "I" beam steel and all steel axles of very strong construction to stand the jolts of the uneven road.

The boiler is resting on a sliding bolster which slides back and forth a distance of fourteen to eighteen inches in making short turns, and thus eliminates shifting of heavy loads at the turn, and assists the trailer wheels to absolutely track with the truck wheels.

In picture No. 3 you can see the fleet of FEDERALS which hauls pipe, standing gear, boilers and supplies of an unusually heavy character to the Goose Creek oil fields.

The picture of the fleet in action shows the condition of the road to be anything but good in this particular spot at least, but the FEDERALS have stood up and done the work through the most severe tests.

The Star Transportation Company is a subsidiary of the Gulf Pipe Line Company which operates many wells in the Goose Creek oil fields, and does an immense business throughout the south. Complete records of operation of the FEDERALS in the service of this company are available and from them we give the following figures on cost of operation of FEDERALS with trailers:

Operations of Two 2-Ton FEDERAL Tractors With Semi-Trailers

	2 Months' Operations			
	No. 10000		No. 10007	
RECORDS	Oct.	Nov.	Oct.	Nov.
Days in service	26	26	29	26½
Days out of repair	5	4	2	3½
Trips	44	43	65	41
Loads in tons	158.7	172.11	293.88	152.19
Mileage	1631	1834	2415	1824
Gallons of gasoline	327½	315½	417	316
Pints of cyl. oil	144	208	137	146
Repair cost	$8.60	$13.78	$5.05	$13.70
DAILY AVERAGES				
Trips	1.6	1.6	2.2	1.5
Loads in tons	6.1	6.61	10.13	5.7
Av. load per trip	3.6	4	4.5	3.7
Ton-miles	112.85	138.82	192.47	125.4
Miles traveled	62.73	70.53	83.27	68.83
Trip distance	37	42	38	44
Miles per gal. gas	4.98	5.81	5.79	5.77
Miles per pt. cyl. oil	11.32	8.81	17.63	12.18
AV. COST OF OPERATION From Their Records.				
Cost per day	$13.02	$12.82	$12.84	$11.79
Cost per mile	.20	.18	.15	.17
Cost per ton	2.13	1.93	1.26	2.07
Cost per ton-mile	.11	.092	.066	.094



No. 2—A 45 Horsepower Boiler Weighing 13,500 lbs., Hauled 65 Miles

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No. 4—This 9000 lb. Load of Lumber Hauled 20 Miles in 2½ Hours



No. 5—Five Tons of Pipe Cost 5 Cents Per Ton Mile to Haul

These will be valuable to many companies who are considering the adoption of this kind of haulage equipment.

Further, a good idea of the various kinds of materials which are hauled by the Star Company may be gathered from the series of pictures which accompany this article, a portion of which we have spoken of before.

Cut No. 4 shows Truck No. 10,007 with a load of lumber weighing 9,000 pounds. This particular load was hauled from Crosby, Texas, to the Goose Creek oil fields, a distance of 20 miles in 2 hours and 30 minutes, 18 miles of the road being shell and in fine condition with 2 miles of sandy road through the woods. Cut No. 5 is of Truck No. 10,000 loaded with over five tons of pipe ready for the 20 mile trip.

point there is a bad rut in the road but the FEDERAL came through without any trouble.

The summary of these trips is given here.

Hauling Standing Rig from Humble to Goose Creek

	Nov. 17th and 18th	
	No. 10000	No. 10007
Miles traveled	165	125
Loads in tons	5 39	4 46
Gallons of gasoline	22	20
Miles per gallon	7 5	6 25
Pints of cylinder oil	17	10
Total cost—Their Records	$28 63	$21 56

Picture No. 8 shows truck No. 10,007 loaded with 19 barrels of crude oil. This load while not bulky is one of the most difficult to bring in from the oil field owing to the stretch of bad road which is covered with

	No. 10007
Weight in tons	5 7
Number of barrels per trip	19
Weight per trip—tons	2 85
Ton-miles	98 32
Gallons of gasoline	12
Miles per gallon	5 75
Pints of cylinder oil	3
Miles per pint	23
Total cost	$11 21
Cost per mile	16
Cost per ton	1 96
Cost per ton-mile	11
Cost per barrel	29

"With our FEDERALS," says Mr. W. C. Turnbow, of the Star Transportation Company, "equipped with trailers, we carry anywhere from eight to twelve thousand pounds per unit on each trip and we have certainly demonstrated the fact that you are building good trucks.



No. 6—The "Standing Rig" of an Oil Well is Bulky



No. 7—And It Is Also Heavy—Notice Size of Timbers

The complete information regarding these trips is contained in the figures below.

Analysis of Two Trips to Goose Creek Warehouse

	Oct. 14, 1916 No. 10000	Nov. 28, 1916 No. 10007
Material	10" pipe	Lumber
Number of trips	2	2
Weight of material—tons	10 15	8 57
Average weight per trip	5 07	4 28
Ton-miles	197 92	162 83
Total mileage	78	76
Trip distance	39	38
Gallons of gasoline	15	13
Miles per gallon	5 2	5 84
Total cost of work	$11 39	$9 90
Cost per mile	14	13
Cost per ton	1 12	1 15
Cost per ton-mile	05	05

Picture No. 6 shows truck No. 10,007 loaded with one of the winches which is a part of what is called the standing rig or derrick, used in the boring operations at the oil fields. This load is both heavy and bulky, but it came through over the road without any trouble.

Picture No. 7 shows truck No. 10,000 loaded with some of the large timbers used in derrick construction in a bit of the bad road on this Humble-Goose Creek Road. At this stumps making it necessary to pick the road on each occasion.

The cost of each trip is carefully compiled by the Star Company which makes positive the knowledge that FEDERAL Transportation pays. Two trips are given in figures herewith.

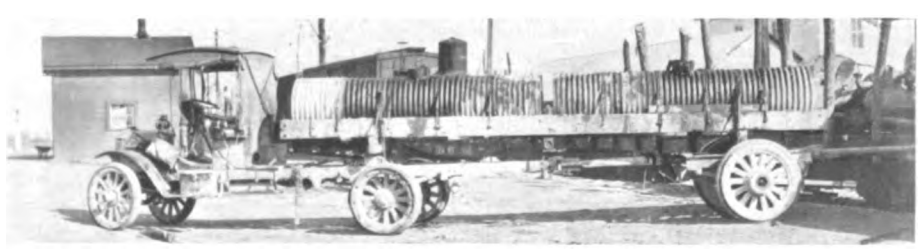
Hauling Fuel Oil in Barrels from Crosby to Barber's Hill

	No. 10007
Trips	2
Miles traveled	69
Trip distance	34 5
Number of barrels	38
Weight per barrel in lbs	300

"We are very glad to learn that you have selected a four-speed transmission for your FEDERALS this season, as that feature will be a great help in starting our big loads.

"This change will be very valuable to us in starting our heavy loads, and we will be very interested in seeing the operation of the new FEDERAL jobs.

"We are keeping our FEDERALS busy all the time on heavy hauls similar to those pictured. Certainly they can have no harder tests than we are giving them."



No. 8—Big Tanks of Crude Oil are Hauled 20 to 60 Miles with this FEDERAL

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Traffic FEDERAL News

Published in the interest of
ECONOMICAL TRANSPORTATION
by the
FEDERAL
MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

Edited by: L. B. DUDLEY : Advertising Manager

EDITORIAL

Delivery

"THE great American business leak is Delivery."

The Chicago Daily News editorial writer never wrote a more literal statement.

This was the prelude to an article which said in effect "somebody pays the freight—who?"

Of course the cost of delivery is added to the cost of the goods—everyone knows that. Indeed it is this knowledge in the face of competition and rising material costs that is causing manufacturers to systematize their delivery with efficient motor units.

The location of the producer or the middleman with relation to the railroad or market has everything to do with the meeting of the other fellow's price, yet the difference between slow, indifferent delivery and fast truck haulage is frequently the difference between profit and loss.

That the saving too, in costs made possible by routed and scheduled motor delivery is sufficient to put the high-cost-slow-delivery-method-firm out of the competitive running, has been proved many times.

TRAFFIC NEWS contains every month the story of one or more firms which have demonstrated to their own satisfaction that motor truck haulage has saved money and built business for them. The Gulf Pipe line in this month's issue for instance has had a peculiar problem to meet, which has been solved only by trucks—FEDERALS.

The Gulf Company has heavy machinery, large timbers and paraphernalia for standing rigs or derricks, big steam boilers, etc., to haul. The way they have solved their haulage problems and the fidelity with which they watch the operation and costs of their haulage equipment is both a revelation and an inspiration to other concerns.

They are determined that there shall be no big business leak in their delivery—but have made of it an asset.

Other firms have not arrived quite at this point yet—but are close. The Traffic Engineering Department of the FEDERAL can definite and helpful haulage figures or will give consider your business individually if you will only ask them.

Time and Trucks

Sixty seconds, surely.

The business man of today must consider the minute—600 of which constitute the average working day.

In most cases if your delivery service has horse-drawn equipment your minutes are being wasted, for with the horse the hours are considered, but with the truck you work in minutes.

You, Mr. Business Man, have a quantity of material, coal for instance, to be hauled three miles. Your horses must have an hour for the round trip of six miles—but the truck is there and back in 30 minutes.

Your truck is driven in beside the car of coal, an efficient loading device puts in three or five tons and the truck is away to the scales—in a minute.

It is at the delivery point in 15 minutes and the three or five tons are dumped—in a minute.

In this day when quick changes are making history, the business man must think and act in minutes. How can you, Mr. Horse Owner, make the most of your opportunities without the efficient motor truck and devices that add to its efficiency?

The "cost per hour" of the horse and wagon is now the "cost per mile" of the motor truck, and that "mile" is traveled, in from three to six minutes.

With these minutes so valuable, you Mr. Truck Owner, cannot secure the greatest benefit from your truck without an exact knowledge of just what it is doing and what it is costing to operate. This brings up the necessity of reliable speed, mileage and time recorders, and of the Daily Service Record.

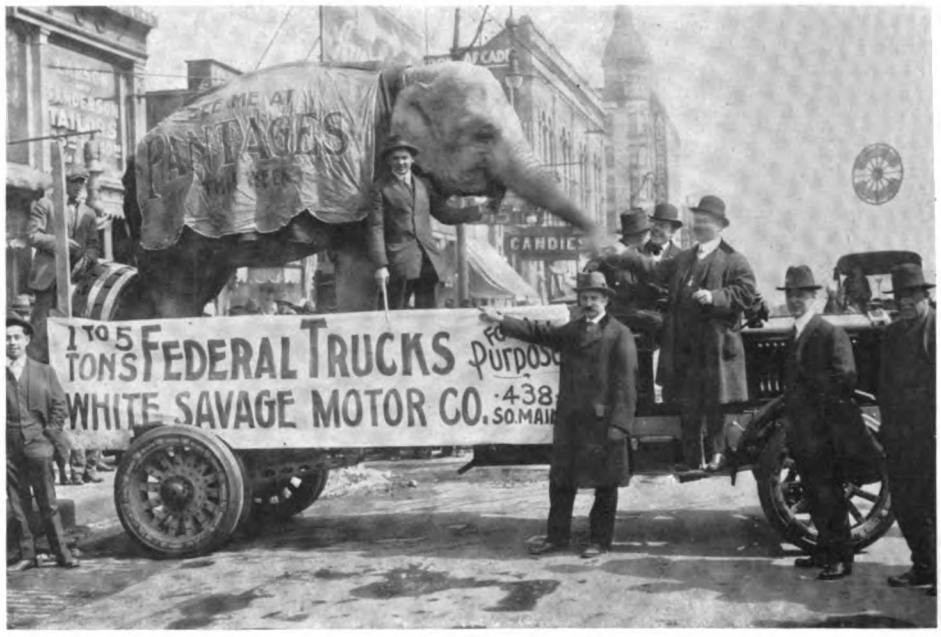
In a few minutes your driver can waste enough gasoline or time to greatly decrease the efficiency of your truck and your delivery system.

Know what your truck is doing every minute of the day. Only by this knowledge can the efficiency of the truck be judged.

The Dreadnought, Stewart and other types of Odometers, the Stewart and other types of Speedometers, the Jones, ASR, Recordograph, Servis Recorder, Speedograph and other recording instruments, are manufactured for this very purpose—to enable the truck owner to make the best use of his minutes.

The Daily Service Record can be furnished by this Company in a form suitable for your particular need. We have made a study of record forms, and as outlined in the April editorial, we have forms for every purpose.

Consider the minute and the hours will add to your profits.



Several Tons of Elephant on a FEDERAL

THE small boy has been proud to carry water for the elephant for years, and many of these small boys cannot forget those days now that they are grown up.

The men in the above picture used to have a regular job in the spring when the circus came to town, and so they were glad to see an exception to the old rule of making the elephant do the heavy work of the show.

In the picture, the FEDERAL truck is hauling several tons of elephant as a demonstration in Salt Lake, Utah.

A. F. Savage, of the White-Savage Motor Company, of that city, sends us this picture to show that his town is not behind the others in having circuses and that the FEDERALS are not behind any other trucks in the whole business.

FEDERALS Make Good in Military Service

THE small picture shown is taken from a Mutual moving picture, showing the First New York infantry on parade down Fourth Avenue, New York City.

The two trailers attached to the FEDERAL and the truck itself are piled with camp equipment. This picture was taken shortly after the boys returned from the Mexican border.

FEDERALS have proved to be equal to the test of army hauling.

There are FEDERALS in the service of nearly every warring nation of the world today, and it is needless to say that they are doing their work efficiently in every instance.



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FEDERAL Drivers' Page

"In honestly striving for a creditable performance you dignify your work and your daily accomplishments become a permanent record that can be pointed to with pride"

Quenching Summer Thirst South of Mason-Dixon Line

The Chero-Cola Bottling Company Gets Real Service From FEDERAL 2-Ton No. 10,262—Records Tell the Story of FEDERAL Economy



WHEN the belated thirst season, now well on its way, arrives with all its force, we, as a nation, will clamor for other lubricants for our internal systems than our old stand-by, H_2O.

To the people of the south "Chero-Cola" has a strong appeal and the delicious beverage is served everywhere "In a Bottle, through a Straw."

Down in Alabam'

Here, as elsewhere, when the sun's rays are actively engaged in melting your collar and trying your already warm temper, the excellent service given by the Chero-Cola Company of Selma, is greatly appreciated.

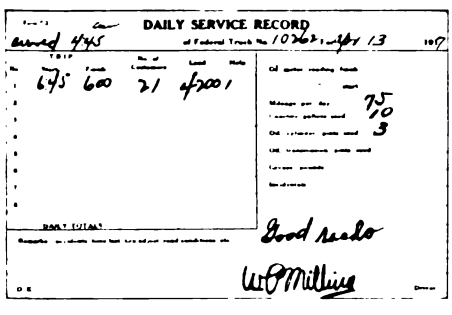
Mr. E. M. Whiteside, manager of this Company, has built up a reputation in and around Selma, Alabama, and he has succeeded in giving the utmost satisfaction to his customers by means of the efficient FEDERAL truck, put into service June 20, 1916.

Manager Whiteside's Opinion

The FEDERAL Motor Truck Company is always interested in the operation of FEDERAL trucks and in helping the owners secure the greatest benefit from them. This is accomplished through the Traffic Engineering Department and when Mr. Whiteside was advised as to the purpose of this department he stated in a letter dated September 4, 1916:

"We think your idea of the record which you propose keeping is a good one and would thank you to forward us a supply of these forms.

"We wish to say that we have had our FEDERAL in operation about two and one-half months, and during this time we have put it to some severe tests under maximum loads and it has never failed to perform its duty. We are very much pleased with this truck and the results which we are getting are very satisfactory."


DAILY SERVICE RECORD

Owned by F&S at [illegible] Truck No. 10262 Apr 13 1917

Trip	From	To	Miles	Gallons	Pints Oil
1	645	600	21	4200	1
				75	10
					3

Daily Totals

Good results

W. P. Milling

Driver's Record For an Ordinary Day

Results of Eight Months' Service

Beginning on September 4th of last year the driver of this 2-ton FEDERAL has filled out a Daily Service Record each day. These records, including the month of April, show the following results:

Days in service	126
Trips made	135
Deliveries made	2602
Number of cases delivered	11720
Weight in tons—approximate	234.40
Miles traveled	8807
Gallons of gasoline used	1233
Pints of cylinder oil used	515

This record emphasizes one of the FEDERAL'S strong points—gasoline economy. The truck traveled the 8807 miles on 1233 gallons of gasoline, thus making 7.14 miles per gallon.

A FEDERAL Plus A Good Driver Equals Efficiency

However, this gasoline mileage could not have been secured if the driver was no t



This FEDERAL Carries an Average of 68 Cases of Bottles Each Accessible

Daily Averages During the Winter

This record covers eight months of weather not particularly favorable to the Chero-Cola business; in fact the truck was in service but one day in February. The average daily performance, however, is very good in many ways.

The truck made but one trip as a rule, but the trips were long as the average mileage—65.23 miles would indicate.

An average of 86 cases of Chero-Cola, about 4 cases to a customer, weighing approximately 3440 pounds, were delivered each trip.

The average standing time at plant per trip was 29 minutes. But 13 minutes was spent per delivery stop and as the total time on delivery trips was 1264½ hours, an actual running speed of 12 miles per hour was maintained.

The Daily Service Record for April 6th told of an unusually long delivery trip. On this day the truck traveled 100 miles on 14 gallons of gasoline and 4 pints of cylinder oil. Eight customers were visited and 80 cases of Chero-Cola delivered. From the time the truck left the plant until it returned, 12 hours, 15 minutes elapsed. An average speed of 10.82 miles per hour was maintained, spending 15 minutes at each delivery stop. No time was wasted on this trip.

honestly striving to give the FEDERAL the proper care and attention. We have said before, and say again, the driver can make or mar the economy of any truck.

Mr. W. P. Milling, whose very picture suggests an ability to do things right, has certainly made the FEDERAL do its best, as it is always ready to do.

Proof of Driver Milling's Carefulness

The record itself is a proof of Mr. Milling's carefulness and desire to do his best, but we have still further proof in Mr. Whiteside's letter of April 26th. He says: "We are also very proud of our Mr. Milling, who is a very careful driver, and he takes pride in the truck, giving good service at all times."

This "pride in the truck giving good service" has enabled Mr. Milling to increase the miles traveled per pint of cylinder oil from an average of 15 to an average of 21 miles per pint.

In this same letter of April 26th Mr. Whiteside again expresses his company's hearty approval of the FEDERAL when he states that "We are very proud of our FEDERAL, and it has done remarkable service for us, in fact the expense, it seems, has been practically nothing. We have been driving this truck over ten months and are mighty well pleased with the service it has rendered."

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June Brings More Good Words from Owners



Not a "Tank" Attacking a Trench—Just a FEDERAL on a Test Run

Abraham Manchester, Adamsville, R. I. —General Mdse.

My truck is four years old, have not expended to exceed twenty-five dollars up to date for repairs and paint and it is doing good work and looks fine—my opinion is, we can get a lot of wear and work out of "FEDERALS" if we use them properly. My machine is cleaned, oiled and fed (with gasoline) as often as it is used, always kept clean and will last a long time unless an accident happens to it.

R. A. Bartley, Toledo, Ohio—Wholesale Grocery.

Only use one truck, a FEDERAL giving good satisfaction, for long hauls. Railroad at my door.

A. B. Mahan, Pres. Mahan Grocery Co.—Winchester, Ky.

We have kept no accurate detailed account of the mileage or consumption of gas and oil, but we take this occasion to say that the FEDERAL truck bought from you has been giving us entire satisfaction. We have been using it constantly about ten hours each day since we have had it and have never been hindered an hour by its being out of order in any way.

The Jones Company, Louisville, Ky.—Wholesale Grocers.

We wish to say with pleasure that our FEDERAL has proved itself all that the makers have claimed it to be and we can only say good words for it.

Lohnes Brothers, Quaker Springs, N. Y. —Grocers.

Our FEDERAL truck is used in place of two teams, making from 2 to 6 trips of 13 miles each, per day. It carries an average weight of 3000 pounds per trip and consumes one gallon of gasoline per 8 miles and one quart of cylinder oil to 100 miles.

Lincoln Park Electrical Commission—Chicago, Ill.

Our FEDERAL truck has been in service since May 1912 and has just had the cylinders reground and new pistons put in. This truck is running satisfactorily and giving good service. The operation for the last two years is as follows:

Year	Mileage	Total Cost	Cost per mile
1915	8450	$1369.56	$.162
1916	10380	1397.31	.135

We now have a small crane which attaches to the rear of the truck allowing us to use it as a wrecking wagon if necessary. The usual service consists in hauling various classes of material.

Electric Bottling Co., Springfield, Mo.—Soft Drinks.

We are proud to advise you that we are operating one of your ton and one-half trucks, having purchased same in the early part of July, 1916.

Springfield, Mo., and its surrounding territory is located in the midst of the Ozark Mountains, and the roads are very hilly and

(Continued Below)

FEDERALS Thoroughly Tested

ROAD tests of the ordinary sort do not satisfy the FEDERAL standards. FEDERAL sends out men to find roads that will give FEDERALS something to do besides play.

That is why the one shown here is plowing through mud with a full load.

FEDERAL testers hunt for the places where other trucks do not dare to venture, as shown by the accompanying pictures.

Walter Richardson, head of FEDERAL testing department, is a veteran FEDERAL driver and none knows better than he what FEDERALS will do in the rough going.

He likes to make his "big beauties" go through their "stunts" and is just as proud of them as a father is when his son goes out into the world to seek his fortune.



Walter Richardson, FEDERAL Chief Tester at the Wheel



A Peculiar View of a Truck—The Big 5 Ton Topping a Sand Hill on the Test

June Brings More Good Words From Owners

(Continued From Above)

sandy. The truck covers a distance of approximately fifty miles every day and during all the time it has been in operation, it has never been laid up in the shop for repairs. Our next truck will be a FEDERAL.

Paige-Detroit Motor Car Company, Detroit, Mich.

It may interest you to know that the FEDERAL truck purchased by us several months ago has been giving very good service under extremely severe conditions during the past winter.

Since the purchase of the first truck we have added a lighter truck of your make to our equipment, which we anticipate will give equally as good service as the heavy type.

A. E. Nye, Oneonta, N. Y.—General Baker.

We consider the FEDERAL the best truck ever in this part of the country.

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Firestone

Truck Tires

When you equip your trucks with Firestone Truck Tires you do so with the assurance that you have obtained the most recent, proved design. For example, Firestone Giant Tires, here illustrated, were the first of their type. Three years ahead of other truck tires. They dominate the heavy truck field today. They respond to the formidable demands of heavy duty service with resilience, traction and Most Miles per Dollar.

There's a Firestone Tire built especially for your truck and your service. Call in the Firestone man.

FIRESTONE TIRE AND RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

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It's About Motor-Trucks

A motor-truck isn't emotional or romantic. Like the most valuable things in life, it is rather prosaic. Some things pay dividends in fancy, which is vastly different from fancy dividends. The motor-truck has to pay dividends in dollars.

How the Food Crisis Is Selling Motor-Trucks

The motor-truck has made greater progress in the past year than in the five years preceding, and greater progress in the past two months than in the 200 months preceding.

Even if the greater economy were the only consideration, present conditions would force the more universal use of the motor-truck and commercial car.

The cost of maintaining a horse has more than doubled with oats at 80 cents a bushel, corn $1.50 a bushel, and hay in the same ascending scale.

While it now costs twice as much to feed a horse, he can do no more work than he did before. He is capable of only so many hours of work a day. He is liable to sickness or fatal injury.

The whole nation is bending its energies in organizing and coordinating its resources to bring all activities to a higher efficiency in order successfully to meet war conditions.

Edward A. Bradford, of the Department of Agriculture, is the authority for this statement:

> "Human muscle power is one of the costliest and least productive of prime movers. Perhaps the next worse is horse power."

In these times of stress, even if the motor-truck were not more economical to operate, the demand for greater efficiency would make motor-driven vehicles supplant thousands of horses.

There is a bigger, broader, more important consideration, one that comes home to every human being—the food supply.

The United States Department of Agriculture has established the cost of feeding horses in relation to human beings.

The Department says:

> "It takes something more than three average acres to supply a human being.
> "It takes something more than five average acres to supply a horse."

So every team of horses costs more to maintain than three human beings.

The great war will be won or lost by food. All the authorities are agreed upon that.

Even if there be no actual pinch of hunger, the rising cost of foodstuffs is bound to crystallize into an irresistible public opinion whose object will be to compel the conservation of food.

Those who employ horses to do work that motor-trucks can do better may have to justify the use of horses.

The Buying State of Mind

When a man reads *The Digest* he is serious, judicial but receptive. He wants the information he knows is important to him, information that has authority behind it and which he knows is printed to help him.

The first factor that makes one publication more valuable than another is the intrinsic value of its editorial contents to the individual and to the public.

The plain truth is that the prospective buyer of motor-trucks has the same state of mind toward the advertising as he has toward the editorial contents of the magazine.

The economic value of *The Digest* as a salesman of a selective product, such as motor-trucks, is apparent, and its position as the principal factor in motor-truck advertising is a matter of record.

Immediate **National Publicity**

The Literary Digest

Forms close 10 days in advance

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First Five Months of 1917

Record of Motor-Truck Advertising
January to May Inclusive

This table shows the number of lines, equivalent in full pages, and the number of individual advertisers.

	Literary Digest	Sat. Eve. Post	Scientific American	Collier's	System	Leslie's	Metropolitan	World's Work	Review of Reviews	Nat'l Geog.	Christian Herald	Life	Independent
The Autocar Co	2205	....	....	....	....	....	....	....	....	....	....	....	....
Automatic Transportation Co	....	....	....	....	112	....	....	....	....	....	....	....	....
Bethlehem Motors Corporation	882	904	....	756	448	....	....	448	....	....	....	....	....
Champion Motors Co	....	....	....	....	....	....	680	....	....	....	....	....	....
Commercial Truckmobile Co	441	....	....	....	....	....	....	....	....	....	....	....	....
Dart Motor Truck Co	....	....	800	....	....	....	....	....	....	....	....	....	....
Denby Motor Truck Co	....	....	....	....	....	....	....	....	....	224	....	....	....
Eastern Truckford Co., Inc	1074	680	596	376	....	....	170	....	....	....	....	....	....
Federal Motor Truck Co	2205	..	5600	2564	896	1176	680	448	448	224	....	448	2520
Four Wheel Drive Auto Co	2205	340	....	....	....	....	....	....	....	....	....	....	....
General Motors Truck Co	2205	4000	4000	3780	1120	....	....	....	....	....	....	....	....
General Vehicle Co., Inc	....	....	1200	....	....	....	....	....	....	....	....	....	....
Hurlburt Motor Truck Co	441	....	....	....	....	....	....	....	....	....	....	....	....
Indiana Truck Corporation	....	1360	....	....	....	....	....	....	....	....	....	....	....
International Motor Co	....	....	1600	....	....	....	....	....	....	....	....	....	....
Kelly-Springfield Motor Truck Co.	....	....	600	....	....	....	....	224	224	224	....	....	....
H. J. Koehler Motors Corporation	441	510	....	....	....	....	....	....	....	....	....	....	....
Martin Rocking Fifth Wheel Co.	882	....	....	....	....	....	....	....	....	....	....	....	....
Maxfer Truck & Tractor Co	441	....	800	....	....	....	....	....	....	....	680	....	....
Maxwell Motor Co	....	1360	....	....	....	....	....	....	....	....	....	....	....
Northway Trailercar Co	....	340	....	....	....	....	....	....	....	....	....	....	....
Packard Motor Car Co	1513	....	3200	....	1120	1203	....	....	....	....	....	....	....
Pierce-Arrow Motor Car Co	1323	2040	3400	....	....	....	....	....	....	....	....	....	....
Reddon Motor Truck Co., Inc	882	1360	....	....	....	....	....	....	....	....	....	....	....
Reo Motor Car Co	441	....	....	756	....	2040	....	....	....	....	680	....	....
Republic Motor Truck Co	1764	2040	....	3780	56	2040	....	....	....	....	....	840	....
Rush Delivery Car Co	441	680	....	....	....	....	....	....	....	....	....	....	....
Service Motor Truck Co	441	1360	....	....	....	....	....	....	....	....	....	....	....
Smith Motor Truck Corporation	2646	4760	....	3780	896	....	....	....	....	....	680	....	....
Stewart Motor Corporation	882	1020	....	1134	....	....	....	....	....	....	....	....	....
Studebaker Corporation	441	600	....	....	....	....	....	....	....	....	....	....	....
Troy Wagon Works Co	882	....	1600	....	....	....	....	....	....	....	....	....	....
Vim Motor Truck Co	....	2040	....	....	....	....	....	....	....	....	....	....	....
Watson Wagon Co	1561	....	....	376	224	896	340	224	560	....	....	....	....
The White Co	1764	1360	4000	....	....	....	....	....	....	....	....	....	....
Total Number of Lines	28403	26914	27396	17302	4872	7355	1870	1344	1232	672	2040	1288	2520
Number of Lines to a Page	441	680	800	756	224	680	680	224	224	224	680	420	420
Equivalent in Pages	64	40	34	23	22	11	3	6	5½	3	3	3	6
Number of Advertisers	24	18	12	9	8	5	4	4	3	3	3	2	1

In compiling these figures 60 publications were checked. Every magazine carrying one or more truck accounts is given above. Truck accessory advertising follows truck advertising, and at the end of the year 1917 *The Digest* will print in detail the complete data of truck accessory advertising.

1913
Motor Trucks

The Literary Digest	18	Advertisers
Life	11	"
System	10	"
Collier's	9	"
Saturday Evening Post	9	"

1914
Motor Trucks

Saturday Evening Post	10	Advertisers
The Literary Digest	8	"
Review of Reviews	8	"
Scientific American	6	"
System	6	"

1915
Motor Trucks

The Literary Digest	11	Advertisers
Collier's	7	"
System	7	"
Review of Reviews	6	"
World's Work	6	"

1916
Motor Trucks

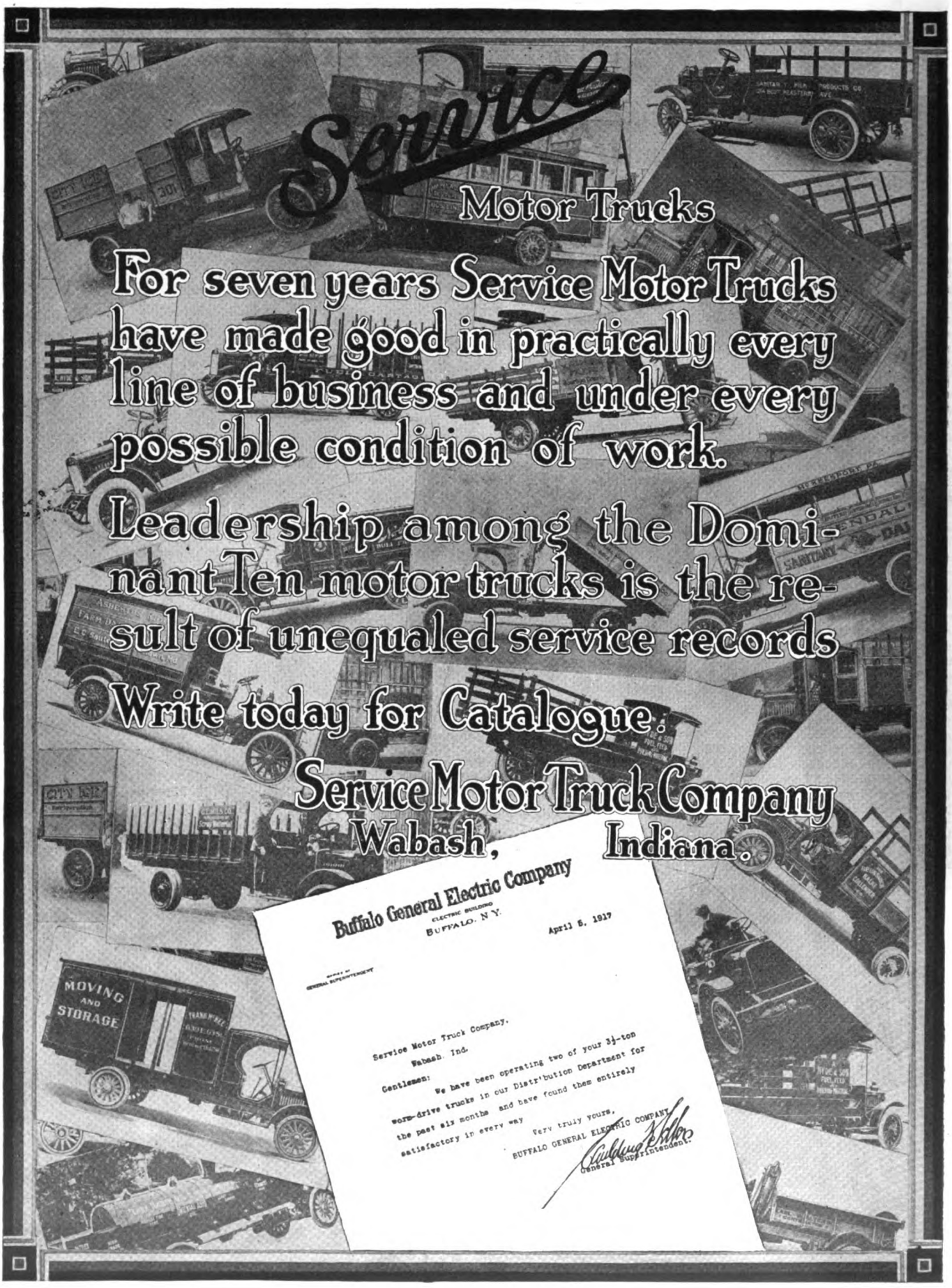
The Literary Digest	21	Advertisers
Scientific American	12	"
Saturday Evening Post	12	"
System	11	"
Review of Reviews	8	"

Immediate National Publicity

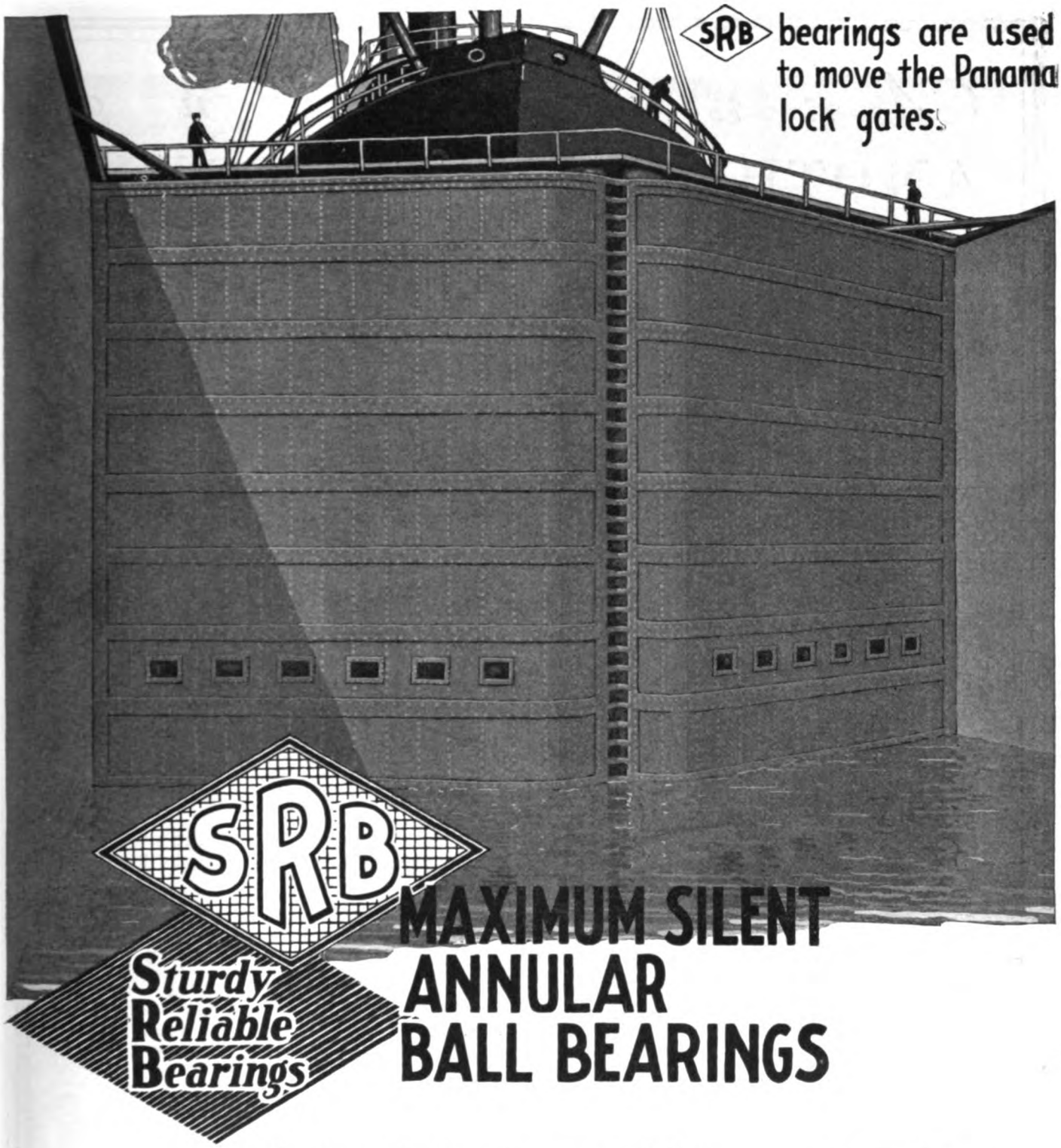
The Literary Digest

Forms close 10 days in advance

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SRB

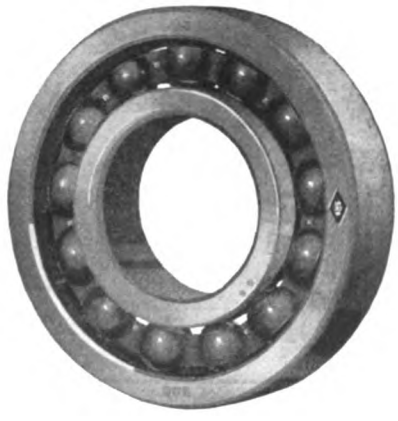
Sturdy Reliable Bearings

MAXIMUM SILENT ANNULAR BALL BEARINGS

For thousands of smaller purposes S R B bearings are proving equally efficient and reliable.

Whether your requirements demand large or small bearings, our Engineering Department will aid you in selecting the right type of bearing to secure the geatest service.

Dealers in cities where we have no representative will find our agency proposition very interesting.



Makers of S R B Annular Ball Bearings, Ball Thrust Bearings, Taper Roller Bearings, Steel Balls and *Rudge-Whitworth* Wire Wheels.

Standard Roller Bearing Co.

PHILADELPHIA, U. S. A.

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Announcing

ANOTHER COVERT FACTORY



At Detroit

IN response to the increasing demand for Covert Transmissions of the motor truck type, we are pleased to announce the establishment of an additional motor truck transmission factory at Detroit.

This plant is a modern 5-story building—designed and built for manufacturing purposes only. It will have a production capacity of 200 transmissions per day in addition to the regular daily output of the parent factory at Lockport, N. Y.

Catering particularly to the motor truck trade of which Detroit is the center, this new plant will specialize in the production of the Covert "unit" and "amidship" models of truck transmission—both 3-speed and 4-speed types.

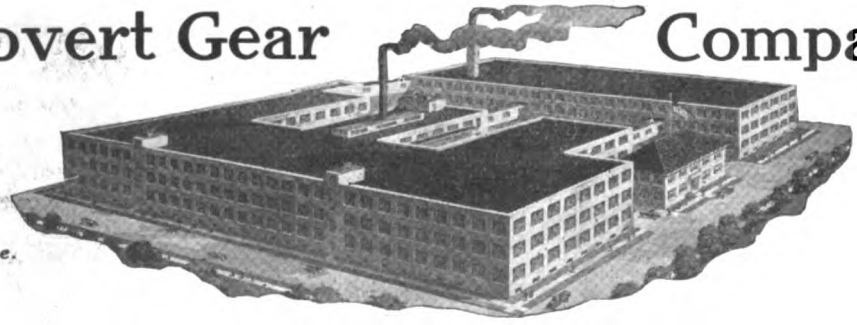
The Detroit plant will be operated in conjunction with the Lockport factory, and will be under the management of Alwin A. Gloetzner, resident Sales Manager and Chief Engineer.

The plant is being installed with the equipment necessary to enable us to get into production by July 1st.

The Covert Gear Company, Inc.

Sales Engineering and Service

967 Woodward Ave.
Detroit, Mich.



Factories:
Lockport, N. Y.
Detroit, Mich.

At Lockport

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MASTER TWO TON TRUCK $2250 F.O.B. CHICAGO

An Awaiting Market

MASTER Two-Ton Truck—an engineering achievement that has won instantaneous success in the motor truck industry—is the development of 14 years specialized effort in exhaustive study of motor truck requirements. Every part of this wonderful truck was designed and is built with this 14 years experience as a basis.

100% Efficiency—100% Economy

The determination of Master Two-Ton Truck engineers to develop a truck unparalleled in the two most important requirements of motor truck service—100% efficiency and 100% economy—is apparent in daily performance of Master Two-Ton Truck.

In every day service and under every condition Master Two-Ton Truck is accomplishing performances that prove beyond all question its unusual efficiency in any line of work where the average load is from 4,000 to 5,000 pounds.

Back of every Master Two-Ton Truck stands proved value in construction and proved efficiency in performance.

Immediate Sales for Dealers

Back of every Master Two-Ton Truck stands a selling organization and co-operating plan which are making Master dealerships among the most profitable.

If you are interested in the biggest money-making dealership available, mail the coupon below for new book on Master Motor Truck performance and dealership opportunity.

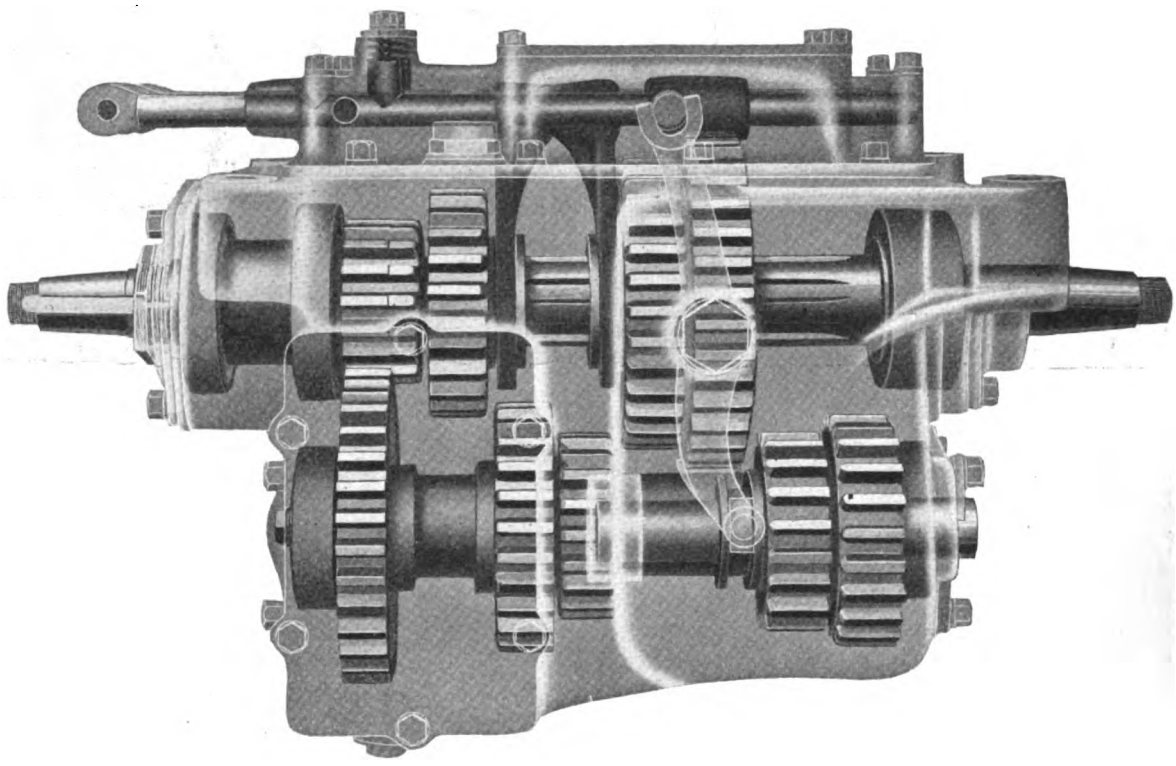
Master Trucks, Inc.,
3132-36 Wabash Ave.,
Chicago, Ill.

Send your free book and dealer proposition on Master Two-Ton Truck.

Name.....
Street Address.....
City.....
State.....
Dealer?.....
User?.....

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WARNER
GEAR COMPANY OF MUNCIE



Warner Gear Company Tr
for United States Army

Model T53 transmission, K12B clutch and C30A control are new designs made up in full accordance with specifications of the United States War Department and are on file in the Quartermaster's Department at Washington.

All three assemblies are in production at this time and ready for immediate delivery.

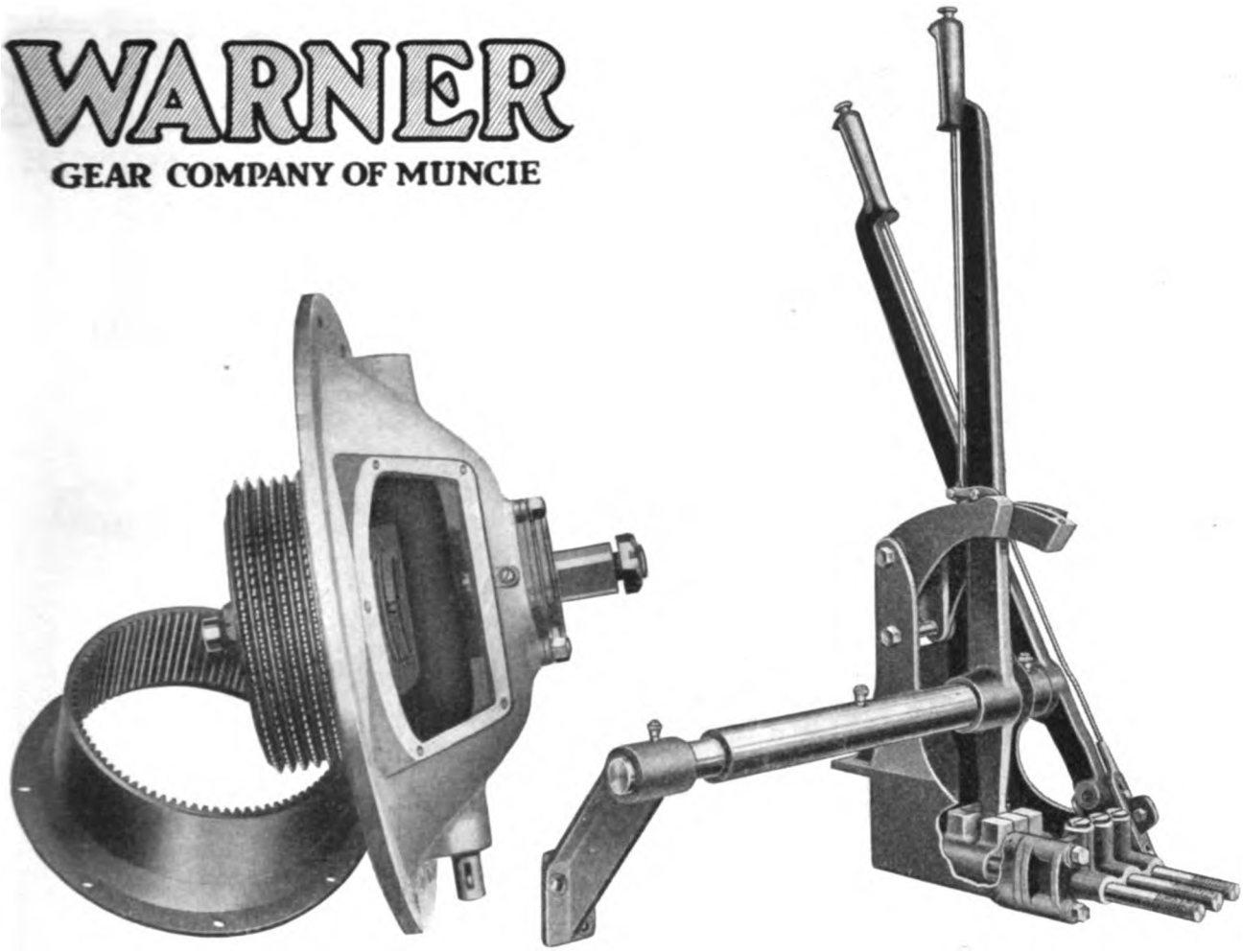
The transmission carries four speeds forward and one reverse and is for mounting beneath cross members for easy removal or inspection. Gears are 1¼" width of face, drop forged heat treated and carbonized alloy steel. Shafts are heat treated and carbonized alloy steel and are mounted on annular bearings. An opening in the left side of the cast iron housing is provided for a power take-off from the countershaft drive gear. The direction of the shifts is strictly in accordance with army specifications as is the oil level filler plug on the right side of the housing. The reduction on low speed is 4.99 to 1 with 5.78 to 1 on reverse.

WARNER GEAR COMPANY, MUNCIE, INDIANA

Detroit Office, 967 Woodward Avenue

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WARNER
GEAR COMPANY OF MUNCIE



nsmission Clutch & Control
Class "A" Motor Trucks

Model C30A control operates model T53 transmission. It mounts on the frame cross member for right hand operation. Control lever positions in the various speeds and the reverse latch rod conform to government requirements. Levers are of drop forged steel. Castings are of malleable iron. The construction thruout is extremely heavy.

The clutch, model K12B, is designed for bolting against the flywheel housing of a unit power plant type of motor making it water, oil and dust proof. It is of the multiple disc dry plate type with serrated driving discs faced with wire asbestos friction material. All bearings are of the ball type, and are lubricated from an oiler in the top of the housing and thru an oil lead drilled central in the clutch shaft. Outside adjustment is allowed to compensate for any wear. Thrusts are self contained when clutch is engaged.

FOR IMMEDIATE DELIVERIES

WARNER GEAR COMPANY, MUNCIE, INDIANA

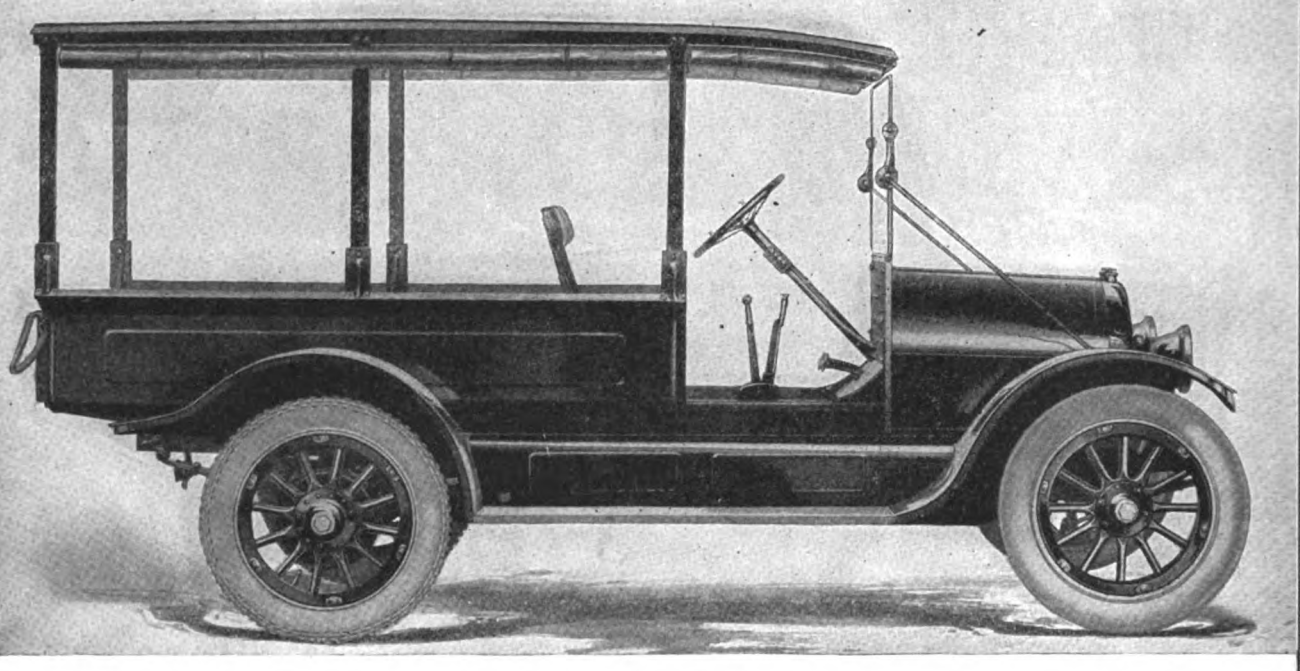
Detroit Office, 967 Woodward Avenue

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Overland

TRADE MARK REG.

1200 lb.
Delivery Wagon
Express Type
$850
Chassis $800
f. o. b. Toledo
Prices subject to change without notice



Invest In An Overland—It Pays

G.S.C. GUARANTY PLAN

Buy it on Guaranty Time Payments

Business men engaged in all lines of trade requiring light hauling have found from experience that Overland Delivery Wagons are the *cheapest in the long run.*

At the price—$850—the 1200 lb. express type shown above is an exceptional value. It has been the *ultimate* choice of merchants both large and small, in the metropolitan centers as well as in the smaller cities and towns scattered throughout the country.

You can use one of these time saving delivery wagons in *your* business and use it to advantage.

Just remember that when you buy an Overland you are getting a delivery wagon that will serve you steadily and faithfully *over a period of years.*

Also bear in mind that the first cost of a delivery wagon is *not* the most important cost.

Ask the nearest Overland dealer for a practical demonstration. Let him tackle your delivery problems.

The Willys-Overland Company, Toledo, Ohio
Manufacturers of Overland and Willys-Knight Automobiles

Willys-Overland Motor Cars

Digitized by Google

BOCK

Everything Rolls.

Freedom from Friction
An Exclusive Bock Feature

Friction is bound to cause trouble sooner or later, whether it occurs in a roller bearing or any other part of a machine.

How long would a tire last if the wheel was locked, allowing it to scrape and slide along the road?

Everything rolls in a Bock Bearing and therein lies the secret of its success. It is the only roller bearing on the market which does away entirely with the wearing, grinding, sliding friction at the ends of the rollers.

Note the illustration above. The roller ends are sections of perfect spheres. They *roll* in unison with the tapered rollers, while other types of bearings scrape and slide at this contact point.

It is this exclusive *ball bearing* feature, combined with the greater load capacity of the roller bearing, that has made the Bock a universal favorite among engineers and manufacturers.

Bock Bearings are replacing all other types of motor car bearings as fast as we can fill orders.

The Bock Bearing Company, Toledo, Ohio

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IN the supreme test of motor car equipment—commercial car service—Fedders Radiators have amply proven their ability to uphold the reputation that has standardized their use on the best pleasure cars built. Our Engineering Department will gladly bring to your radiator problems the experience gained in more than fourteen years' building of highest grade radiators.

THE FEDDERS MFG. CO., Inc., Buffalo, N. Y.

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U.S.
BALL BEARINGS

-U.S. Ball Bearings-

THIS IS THE DAWN OF A BALL BEARING ERA

Efficiency is the elimination of waste.

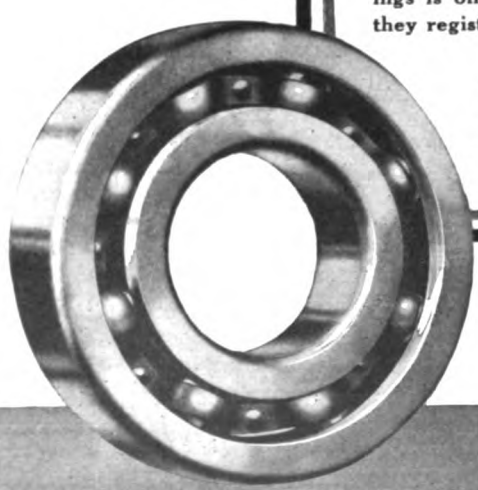
Greatest of all economic wastes is friction.

Greatest of all anti-friction devices is the annular ball bearing—

Because ball bearings absorb only from one-fourth to one-twentieth as much frictional power as the most efficient other types of anti-friction devices. Therefore ball bearings are at least four times as efficient as the most efficient other type of bearing.

Ball bearings show this remarkable efficiency and saving because they operate with a pure rolling motion—the only bearing in which pure rolling motion only is present.

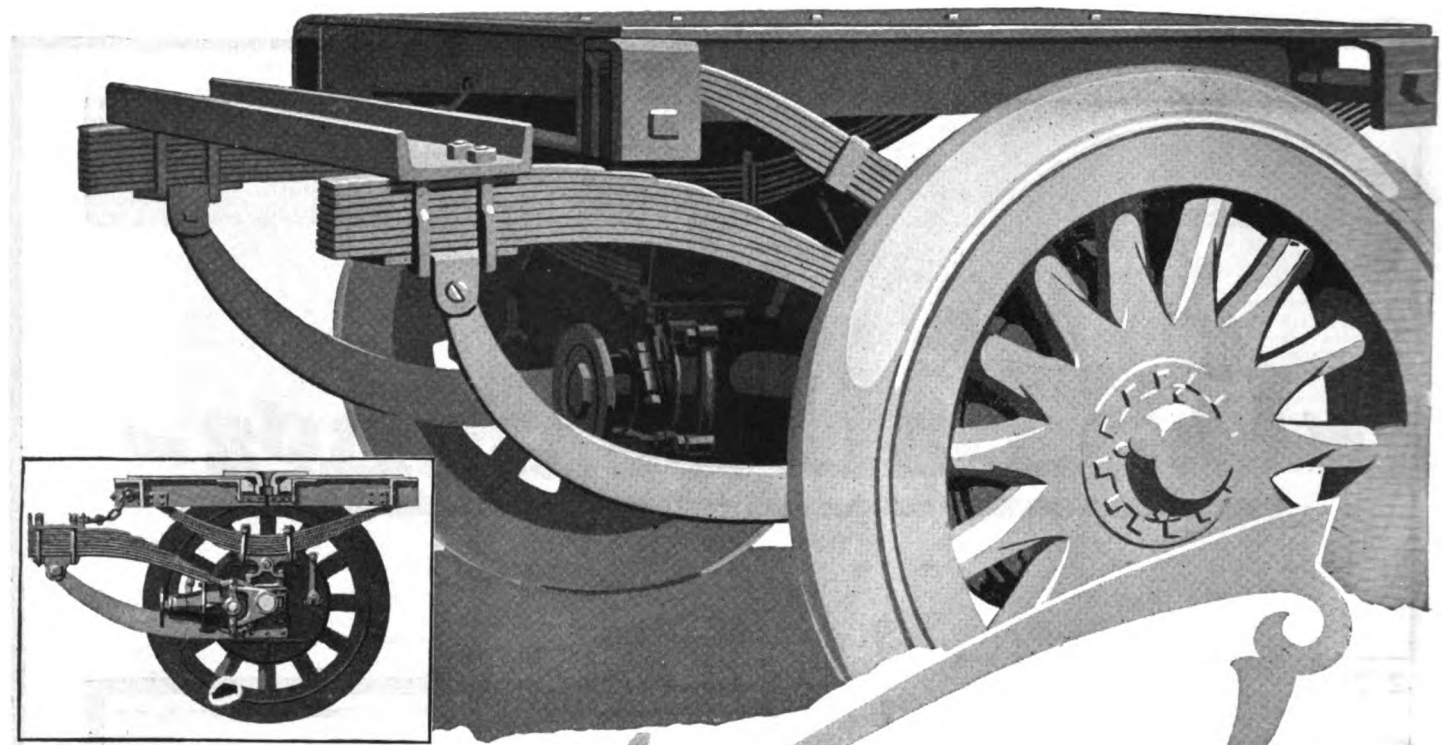
And the few cents higher initial cost of ball bearings is offset in vast degree by the actual savings they register for the ultimate consumer.



U.S. Ball Bearing Mfg. Co.
(CONRAD PATENT LICENSEE)
Chicago / / / Illinois

BALL BEARINGS FOR EFFICIENCY—OTHERS FOR PRICE

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Cross-Section showing two sets of springs. Flexible cantilever type for supporting power-plant. Half-elliptic springs to support load on trailer. The dead axle for supporting load and the live axles for driving are also shown.

THE Knox Traction Unit combines any new or used pleasure car or truck with any horse-drawn wagon, and forms a modern tractor of 2 to 5 tons capacity.

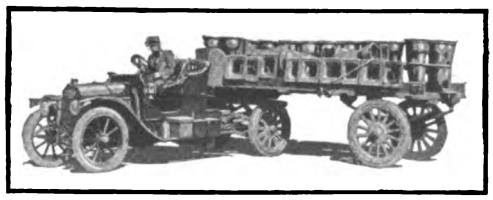
Cuts the High Cost of Motor Trucking. Almost any touring car or runabout chassis answers perfectly for the power-plant of the outfit.

Any horse-drawn truck (stake body, platform body, extension lumber wagon, moving van or bottom dump-body) answers perfectly for the load-carrier. The Traction Unit itself is built in accordance with the best motor-truck practice.

The Knox Tractor Idea. The Knox Tractor idea is proved sound by every locomotive and every tow-boat—they do not *carry* their loads upon their backs—they *haul* their loads behind them.

Where the average pleasure-car engine could *carry* 5 to 7 passengers at high speed, it can easily handle 2 to 5 tons when the load is placed behind and the speed is cut down to 8 to 10 miles per hour through the internal gear reduction.

The Traction Unit. The Knox Traction Unit has been perfected in all its parts. It consists of a complete rear-axle assembly, with wheels, tires, brakes, differential, drive-shafts, torque arms and springs.



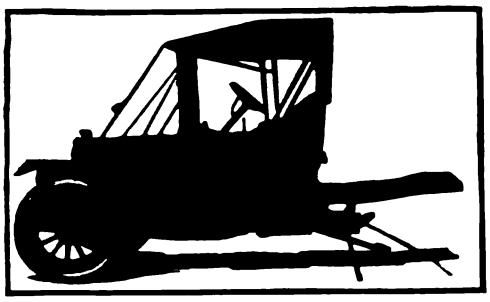
Showing load of iron castings being turned around in ordinary width street. Exceptionally short turning radius.

The famous Internal Gear Drive is used, as this construction permits of a dead axle to carry the load and live axles to do the driving. The power is applied near the rim of the rear wheels, giving an enormous driving leverage.

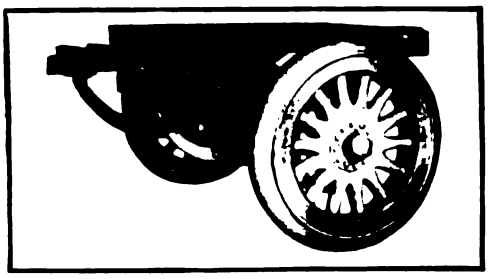
The well-known patented Knox Separate Spring Suspension is also incorporated—one set of springs to support the load and another set of flexible cantilever springs to support the motor vehicle and driver.

Several Trailers to One Traction Unit. The use of several load-carriers to one Knox Traction Unit and power-plant has been found very economical. If a loaded carrier is not ready, it may be quickly detached and the tractor is free to back under some other load-carrier that *is* ready. No waiting by drivers or loading-gang—only a few minutes' work to change from one load-carrier to another.

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1 *Any pleasure car with body cut off and rear axle and springs removed. Drive-shaft disconnected at rear universal joint and brake rods ready to hook up to Traction Unit.*



2 *The Knox Traction Unit ready to be bolted to chassis above shown.*

TRACTION UNIT

TWO-TON, $390
THREE-TON, $570
FIVE-TON, $750

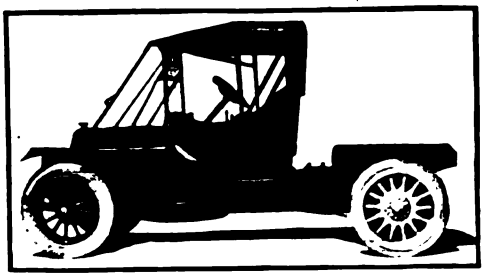
Largest Hauling Capacity for the Smallest Original Investment. The Knox Traction Unit proposition must appeal to all coal and ice dealers, contractors, wholesale grocers, lumber dealers, storage and moving-van people, farmers, general draymen—in fact, all who must handle heavy loads.

With the Knox the change from horses and wagons is made at least cost because horses are high and it is unnecessary to buy wagons—and, as everybody knows, good second-hand pleasure-cars are as plentiful as rooters at a ball game. All you need buy new is the Knox Traction Unit itself.

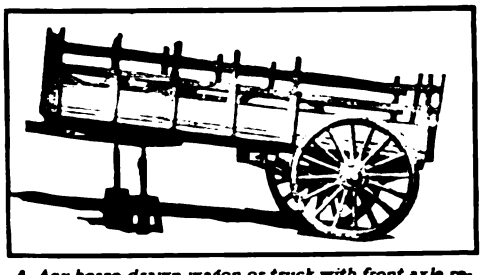
Any Garage or Blacksmith Shop Can Make the Change. No matter where you are, any mechanic can make the necessary change, and do it in a short time. Remove the body back of the driver's seat, remove rear axle with springs, slide the Traction Unit over the frame, square up and clamp cross-member to frame. Next connect drive-shaft and brakes, and—*presto*, you have the equal in capacity and performance of a $2,000 to $5,000 outfit. It has cost you, aside from the old wagon and the time of attaching, $390, $570 or $750, depending upon the capacity of the Unit you have selected.

The only cars that cannot be conveniently changed are those that have the transmission or gear-box unit with the rear axle.

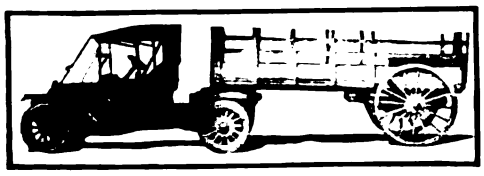
A demonstrated success; not a makeshift. The Knox will move anything, go anywhere exactly like a truck costing several times as much. It will turn around in less space than any motor truck and its brakes will hold more than its rated load. Your old pleasure-car engine does not work any harder or operate at any higher speed than usual.



3 *Car chassis with Traction Unit attached ready for load-carrier shown below.*



4 *Any horse-drawn wagon or truck with front axle removed, jacked up to receive tractor shown above.*



5 *The completed hauling equipment of 2, 3 or 5 tons capacity.*

Sold with the regulation motor-truck guarantee—relieving buyer of all chance and putting it strictly up to the Traction Unit itself to "make good."

Model B, 2-ton capacity, $390. For cars like Ford, Chevrolet, Maxwell, small Buick, etc. This outfit is proving the only safe way to handle big loads with these little cars. As good at their work as the larger sizes.

Model A, 3-ton capacity, $570.

Model C, 5-ton capacity, $750.

Dealers—mail the coupon. If you are alive to the absolutely unlimited sales possibilities of the Knox Traction Unit, fill out the coupon below and mail to us immediately. Some fine territory is still open—but you will have to hurry.

KNOX MOTORS ASSOCIATES, Springfield, Mass.

17 years of Motor Vehicle Building experience

Distributors also of the famous Knox Tractor and the Knox 300-h.p. Aircraft Engine

KNOX MOTORS ASSOCIATES, Springfield, Mass.

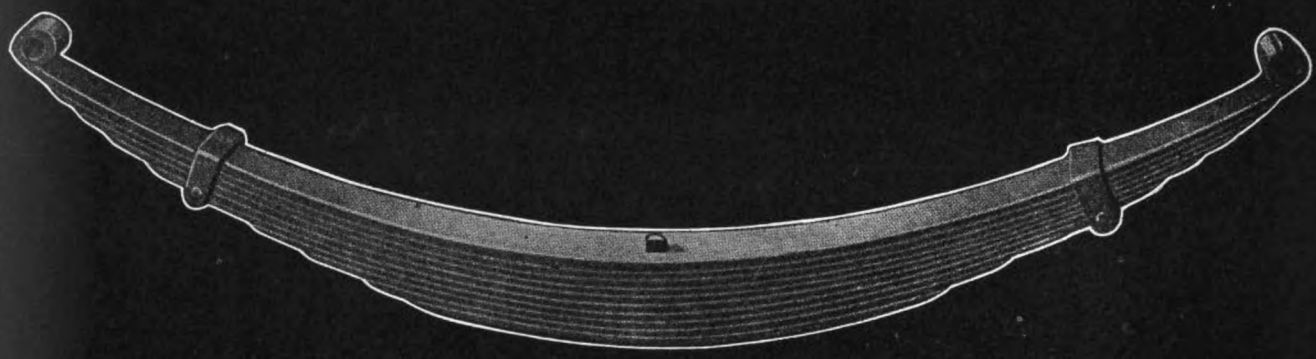
Send me complete details of Knox Traction Unit dealer proposition. The cars or trucks I am now handling are_____

Name_____

City or Town_____ State_____

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"The Spring Is the Thing"



MATHER

Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

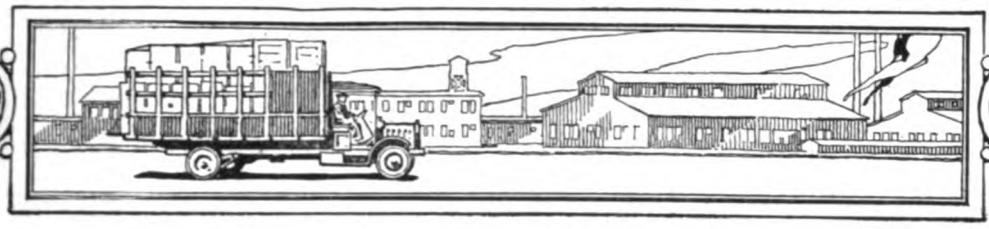
Minimum of Vibration

Genuine made only by

The Mather Spring Company

Toledo, Ohio

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Russel

Internal Gear Drive Axles

The Russel Internal Gear Drive Axle transmits the power close to the rims of the wheels—not at the hubs like other types of shaft drives.

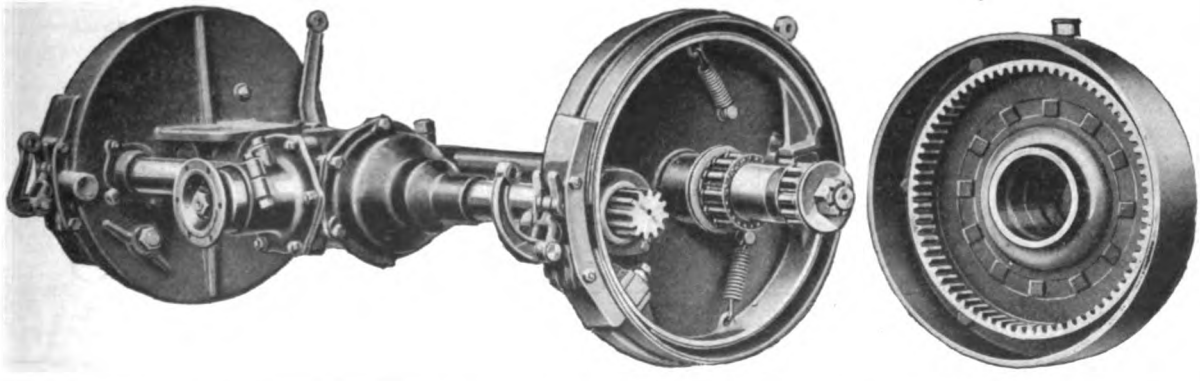
To illustrate our principle, jack up your truck, or any vehicle for that matter, and note that it is easier to turn the wheels by the rim than by the hub.

Why should you not specify a Russel Drive on your next truck?





Russel Motor Axle Company
North Detroit



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ROSS GEARS

THIS CONTENTED DRIVER is only one of *sixty thousand* who go to their homes at night with light hearts and with untired muscles because the trucks that they drive are equipped with Ross Gears. With Ross Steering Gear, even the heaviest truck is surprisingly easy to control, and Ross quality in materials and workmanship gives an added assurance of safety and reliability. *Contented drivers* are one reason why Ross Gears are

The Steering Gears that Predominate on Motor Trucks

In view of the fact that one hundred and fifteen motor truck manufacturers, representing considerably over half the industry, are now using them as standard equipment, every man who buys a truck and every manufacturer owes it to himself to investigate and to demand the superior service guaranteed by Ross Steering Gears.

Write for Catalog and any Special Information desired

ROSS GEAR & TOOL COMPANY
750 Heath Street Lafayette, Indiana

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The COMMERCIAL VEHICLE
Read by Business Men

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The Commercial Vehicle, Inc.

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New York City

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Charles W. Blackman, Vice-Pres. & Gen. Mgr.
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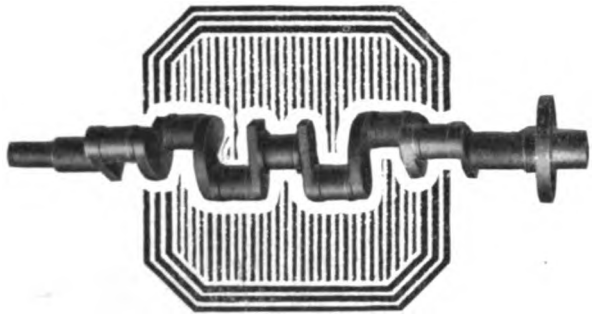
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Detroit, 95 Fort street west Cleveland, 516 Swetland Building

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Canada	3.00 per year
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Changes in copy for advertisements in the next issue to be in the office of publication not later than 10 days before date of publication



WYMAN-GORDON

AFTER ALL, THE STRENGTH OF A GUARANTEE lies in the character of the man or firm who signs it.

THE WYMAN-GORDON GUARANTEE IS FRAMED to cover the entire operation, from the careful inspection of steel, as received, to the prompt delivery of the finished forging.

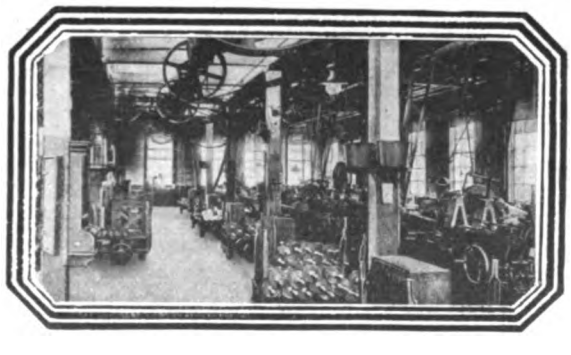
BUT THE REAL FAITH-COMPELLING, comfort-giving feature of Wyman-Gordon procedure lies in the methods rigidly adhered to in actual production.

A PERSONAL INSPECTION OF OUR PLANTS will give you a stronger faith in Wyman-Gordon forgings than any words we could use.

Personal cooperation, in solving difficult forging problems, a specialty.

WYMAN-GORDON CO.
Worcester, Mass. *Cleveland, O.*

GUARANTEED FORGINGS



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"WE operate eight motor trucks and the Autocar is the handiest truck we have," says the Shanahan & Elliot Ice Cream Co., of Philadelphia. "It averages 50 to 60 miles a day, and its remarkably short wheelbase for two tons capacity enables it to get in and around the narrowest streets to make deliveries. We have just bought a second Autocar and expect to get more this spring."

Write for illustrated catalog and list of more than 4500 concerns using Autocars in every line of business

THE AUTOCAR COMPANY

ARDMORE, PA.

Established 1897 **MOTOR DELIVERY CAR SPECIALISTS**

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI July 1, 1917 No. 11

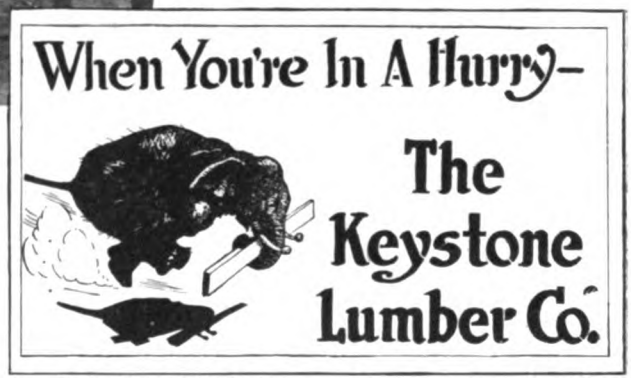


This striking billboard shows how the Keystone company combined its old trademark with its trucks and makes good advertising capital out of both

Advertise Your Trucks

Owners Can Increase Profits by Advertising Service Their Trucks Render

Part I



The old advertising trademark used before the Keystone company owned any trucks

IT pays to advertise. While practically all of the business houses of the United States realize and make use of the important principle, the average motor truck owner has not yet grasped it and made the most of his latent opportunities. While he undoubtedly, in a great majority of cases, advertises the goods which he manufactures, handles, or sells, he has allowed the potential advertising value of the vehicles which he uses to deliver his goods to be almost entirely if not wholly wasted.

Uneeda biscuits, Heinze's 57 Varieties, Sweet Caporal cigarettes, Fairy soap and a score or more articles which are household words throughout the United States have been made such only by consistent advertising. This advertising has cost money, but it has increased sales and with greatly-augmented sales have come bigger and bigger profits.

So it is with the motor truck owner who makes use of the advertising possibilities of his vehicles which he uses to handle or deliver his goods. He makes an otherwise bare body side return him profits which are more than commensurate with the cost of making his vehicles attractive as an advertising medium.

The purpose of this article is to point out a few examples where motor truck owners have made increased profits through the utilization of the advertising possibilities by telling merely what his trucks will do and why the general buying public should patronize his store rather than those of his competitors. There are so many ramifications of different methods whereby truck owners have increased their profits by utilizing the advertising value of their vehicle bodies that they will be taken up in Part II of this article to appear in the July 15 issue of THE COMMERCIAL VEHICLE.

While the day is past since the pedestrian considers a motor vehicle as a sign of more than unusual efficiency and an indication of affluence or stops to gaze at it in wonder, it is generally recognized that a corporation, firm or individual using trucks is stamped as being progressive because of the evident belief in the mechanical rather than animal transportation. The motor truck still offers a very substantial basis

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One form of advertising based on the service of motor trucks, a lithographed calendar sent out by Kibbe Bros., Springfield, Mass., to its old customers and its prospective purchasers. The White truck shown on the right is now used to deliver the Kibbe company's candies, while the four-horse outfit, with its old-fashioned stagecoach, was used 47 years previous to the adoption of railway shipping. In 1915 even the railway facilities were found inadequate, so that trucks were purchased. The Kibbe company was famous for its white four-in-hands and the calendar conserves that feature, at the same time combining with it the latest truck delivery of the company

on which to plan and execute an advertising campaign to increase the sales and profits of all concerns which use them.

Advertising of Two Kinds

This advertising may be divided into two main classes, as follows:

1—Advertising what your trucks will do.

2—Making use of the vehicles themselves as advertising mediums.

In the first class the truck owner should point out to the general public why it should trade with him, who uses a highly-developed motor transportation instead of his competitor who is using horses. He should also point out the advantage of trading with him because of the great distances at which he can serve his customers by the use of trucks—as for instance the department stores, which during the summer are enabled by the use of motors to provide their customers with almost as good service to the neighboring summer resorts as is offered in the city proper during the remainder of the year. If your delivery methods with trucks are better than would have been possible with horses, tell your customers of this fact. Or if you deliver more quickly and maintain an unfailing winter and summer schedule, tell these facts to your patrons or to your prospective customers.

Trucks must have provided some step forward in your transportation scheme otherwise you would not have purchased them. Tell the people who deal with you, or those whom you wish to have deal with you, of this step forward in your delivery methods.

Each particular merchant must have some strong talking point for his use of motor trucks instead of horses and he should determine exactly what this point is or what the most important point is, if there are more than one, and make it the text of the message which he desires to present to the general public or any other particular class which he is trying to reach.

How Advertising May Be Divided

This first class of advertising work which your trucks do may be divided into several classes according to the methods pursued in each case. Advertising may be handled through a general magazine in case the product of the owner is general, or in class periodicals in which it is desired to reach a certain group of persons. Again, billboards and posters may be very effectively used, as is shown on pages 5 and 8 of this issue. Railway and street-car advertising has also been used with very good results in several cases. When unusual conditions arise which tend to impede the delivery of goods, newspapers may also be made to carry the message to the public at large or to the particular class which the truck owner is serving. Finally calendars or printed matter sent out to lists of old and prospective customers and bringing out the advantages of the concern's motor equipment have also secured results which more than compensate for the cost of printing the descriptive material.

The second class, or that in which the advertising possibilities of the vehicle body may be utilized, may also be divided into several special sub-divisions according to the particular form of advertising employed. In this case, it is first of all a question of whether the advertising value of an ordinary body may be enhanced by a distinctive painting or by the adoption of some selling slogan somewhat like that of "Ask Dad—He knows," or whether better results can be obtained by the use of a body of an unusual and distinctive character.

Operation First Consideration

No matter which kind of medium is used, the first consideration of the truck owner should be to maintain the efficiency of his vehicles. The wise owner realizes that his truck operation comes first and the advertising value second. The truck whose efficiency has been curtailed through some freak advertising scheme and which then gets continually into trouble on the road and is held up, thereby decreasing the efficiency of the service, becomes at once a mark for the pedestrian and finally an advertising boomerang.

Briefly the requirements for properly utilizing the advertising value of a truck body are that the owner's name should stand out prominently and legibly and second that the general tone, appearance and color of the body should link up the vehicle with the products its owner sells. This may be done in many ways. For instance, a department store catering to the middle or high-class trade should use per-

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haps a body of conventional design, but one of unassuming refinement. In appearance the goods of the owner should be associated in the same way with that of the truck which delivers them. An example of this may be sighted from this issue, on page 31 of which is shown a dairy truck owned by the Pinehurst Farm Dairy Co., which is painted pure white to associate it with the purity of the dairy products which it carries.

Association of Goods and Truck

Similarly, the P. S. Huckins Co., a lumber concern of Boston, Mass., which sells yellow pine almost exclusively, has built its own truck body of yellow pine and finished it in a natural color by the use of varnish instead of painting it. In this manner the body of the vehicle is linked up and associated very successfully with that of the article which its owner sells and which it delivers.

The story in this issue will be almost particularly confined, however, to the method of advertising what trucks can do and presenting several examples of what other merchants have done who have made money by similar measures adapted to their own particular businesses. For example, the Keystone Lumber Co. of Pittsburgh, Pa., for many years employed a trade-mark showing a galloping elephant with a length of timber carried in his trunk. The elephant, while ordinarily a slow-moving animal, was made use of in this case because of its great strength and was shown traveling at a high rate of speed to convey to the Keystone customers that the company attempted to deliver large quantities of lumber quickly. However, since the day of motor transportation arrived, the Keystone company found that its trade-mark was out-of-date, although of originality and attention-getting nature.

When the company purchased its first motor truck it changed its former elephant trademark into one showing its truck carrying a capacity load of lumber with the self-same elephant trailing on behind. In this manner the many years of educational work which the company had spent to get its patrons to associate an elephant with its product were conserved. On the outside of the stakes of the truck are carried two smaller panels, one on each side, on which are also shown the original trade-mark.

As shown on page 5, the up-to-date trademark of the company includes a truck; the original trademark as shown on the side panels with the old familiar elephant bringing up the rear, together with the words "When You're in a Hurry—Keystone Lumber Co." offers a very attractive billboard. Many of these are painted on wood and metal signs throughout the city and have resulted in an increase of business made possible through the use of trucks instead of horses and by the advantage which the company took of this method of bringing its delivery service to the attention of the public in general.

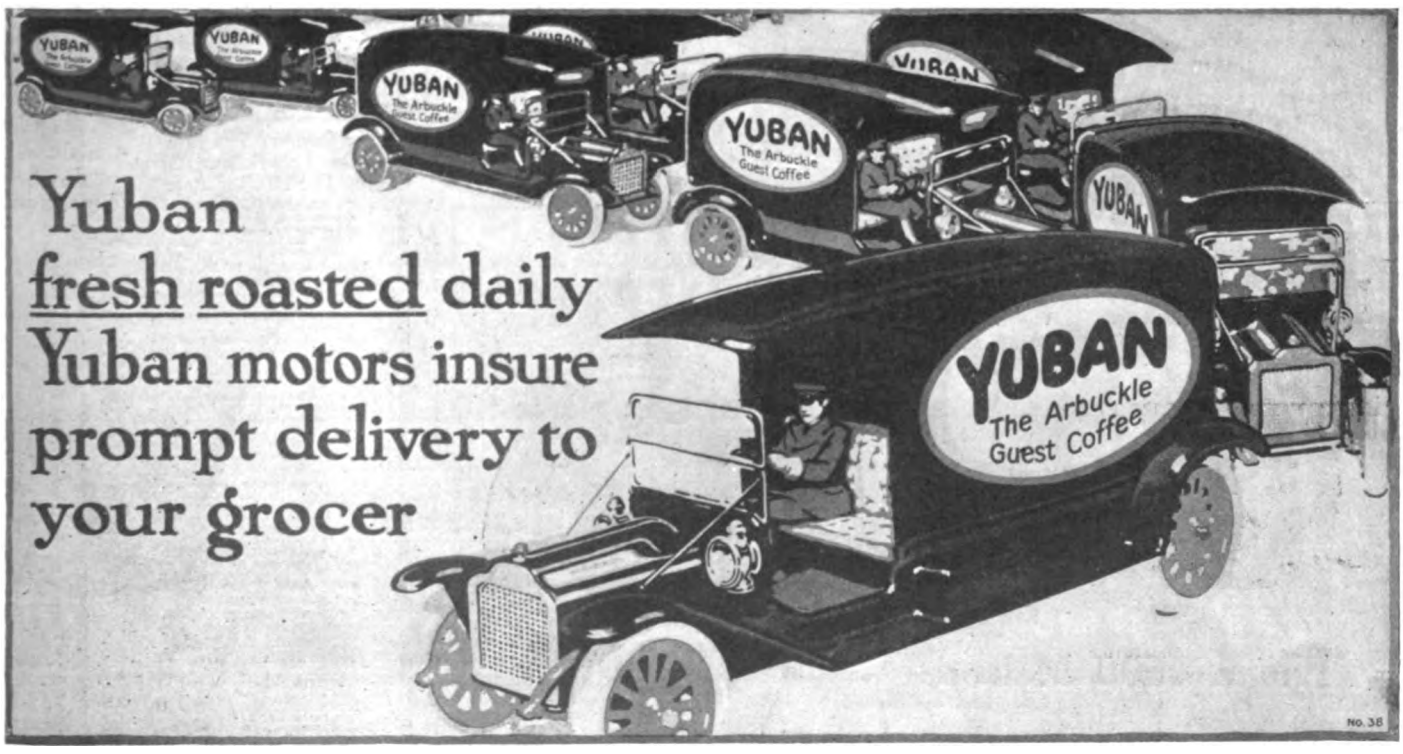
Kibbe Advertises Trucks on Calendars

Another successful utilization of the advertising value of the motor truck has been secured by Kibbe Bros., a progressive candy firm of Springfield, Mass. That concern is 74 years old and formerly made its deliveries by the use of teams of four white horses and old-fashioned stages, which made long trips from town to town. In the old days, these chariots of sweets delivered the company's goods in Springfield and the surrounding territory. White horses were used because Horace Kibbe said: "A white horse shows its care or the lack of it."

In the winter season a combination of wheels and sled runners enabled these vehicles to meet the existing road conditions, but as transportation facilities improved Kibbe's four-in-hands yielded one by one to superior methods of delivery and in 1890, after 47 years of use, the last of the eight outfits employed was withdrawn. Following this, the candy was delivered by single hitches in the immediately surrounding territory and by railway in the outlying areas until 1915, when Kibbe again found transportation facilities inadequate.

Motor trucks were bought to solve the problem. With the selling slogan of "Fresh from the Factory," one of the trucks, a White 2-tonner, furnishes perhaps the best example of Kibbe's quick delivery direct from the factory to the merchant's store. This truck covers Connecticut west of the Connecticut River and carries loads 75 miles out of Springfield.

The reputation which the Kibbe company made for itself in the old days with its striking four-in-hands of white horses has been retained and put to good advertising use by utilizing illustrations of both the white horses and the White motor truck means of delivery on a large yearly calendar which it distributes to its customers and to its prospective pur-



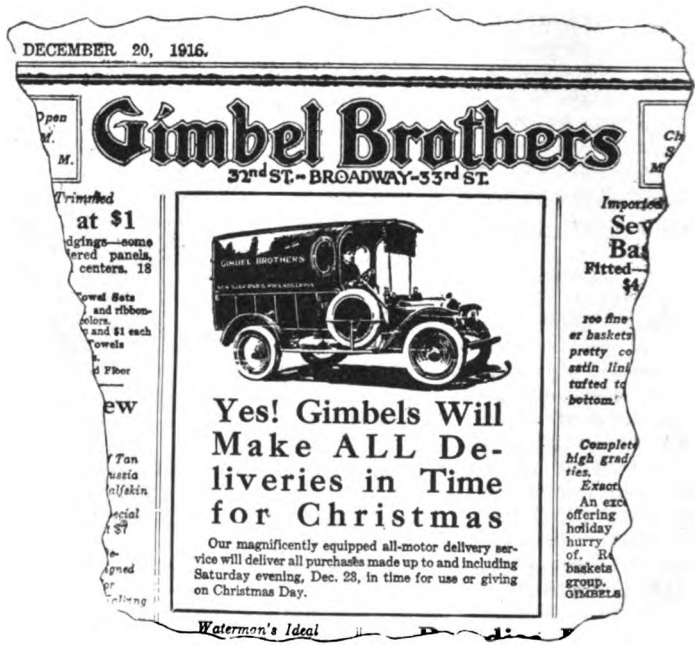
One of a series of subway, elevated and street-car advertising cards used by Arbuckle Bros., in New York City and Chicago, to increase the sale of Yuban, the Arbuckle guest coffee. Note that the advertising appeal is based on the prompt and certain delivery of the coffee to the retail grocers by means of its motor truck fleet. Everybody wants freshly-roasted coffee. By roasting its coffee daily and delivering it daily to the grocer, by motor trucks, the Arbuckle company makes it possible for the purchaser to get the coffee while it is still fresh and has its full strength. The color scheme is the same as that used on the wrappers

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Truck Car Signs and Posters That Have Brought Results

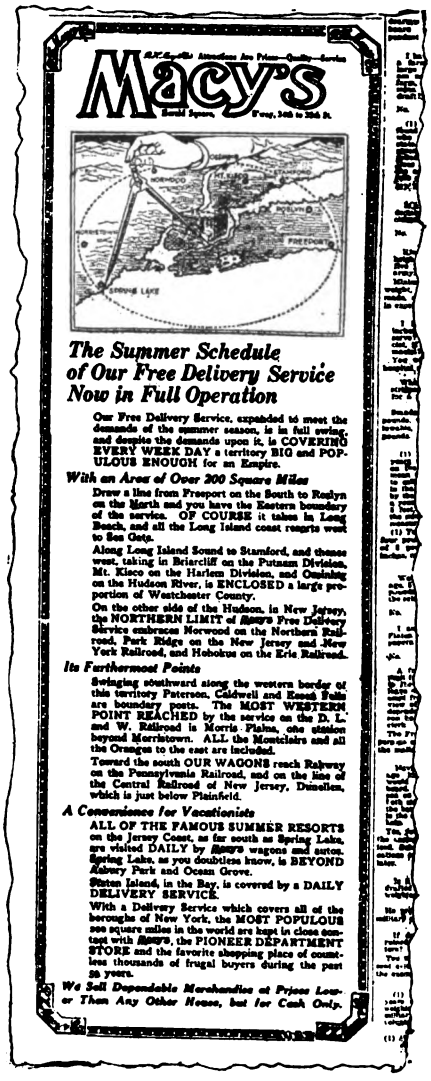


A multi-color poster used by a New York coal company to increase its sales. Note that the appeal is made on the careful delivery made possible through the use of a fleet of fourteen motor trucks. Note also how the company's trademark is included in the layout for the purpose of association



Advertising future deliveries by the dependable motor truck. A tribute to the commercial vehicle of real dollars and cents value that resulted in greatly-increased sales

How R. H. Macy & Co., one of New York's largest department stores, advertises that it will serve its customers, mostly by motor, while they are away at nearby resorts during their summer vacations





Every one knows that horses have hard times delivering coal on streets deep with snow. The Stephens coal company takes advantage of this fact by advertising that its trucks make unfailing winter deliveries

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chasers. A reproduction of one of these calendars is shown on page 6.

Yuban Delivered Quickly by Motors

Another example of an excellent use of efficient motor truck delivery to advertise a concern's product is that employed by Arbuckle Bros. At the present time that concern is running an advertising campaign on its Yuban guest coffee in New York and Chicago, where it is carrying its advertising in the subways and elevated and trolley systems of those two cities.

The cards picture the trucks of the Arbuckle company and mention that Yuban coffee is fresh roasted daily and that Yuban motors insure its prompt delivery to the grocer. In other words that advertisement says, "You should buy Yuban coffee because we roast it fresh daily and because our trucks deliver it to your grocer daily, from whom you may buy it while it is still fresh."

This is the advertising message which the company has been able to bring out with the use of motor trucks instead of horse vehicles. Furthermore, the product of the company has been linked up not only with its trucks but also the advertising itself, which is done in buff and brown, the same colors as the wrapper in which the coffee tins are done up.

While the particular card showing the trucks as published on page 7 is only one of a series of cards used in these campaigns, the Arbuckle company attributes a large proportion of its increased sales to its advertising, although of course no definite figures can be given as a result of the use of the one kind of card shown.

Increasing Coal Sales

Olin J. Stephens, Inc., a coal concern which operates fourteen motor trucks in New York City, has also increased its sales by means of street-car advertising signs and subway bill posters in which the unfailing deliveries by motor trucks in summer and winter were the outstanding appeal. The posters are toned in several colors properly blended to make



Body advertising expressed by the association of the yellow pine sides with the yellow pine timber carried by the truck

an attractive design, one of which is reproduced on the top of page 8.

The trolley-car sign is reproduced on the bottom of the same page and includes an illustration of one of the Stephens trucks in addition to the company's regular trade-mark, so that the commercial vehicle and trade-mark are coupled up to make the pedestrian or trolley passenger realize that whenever he sees the Stephens' trade-mark on a vehicle, he knows at once it is one of the company's trucks.

Department stores are, as a class, large users of motor trucks and in many cases have taken advantage of the advertising value of their vehicles. One such advertisement inserted by Gimbel Bros., New York, in one of the newspapers of that city, showed one of the concern's fast cars with a statement that its delivery fleet would deliver all of the purchases made up to and including Saturday evening, December 23, in time for use or giving on Christmas day. This is indeed a great tribute to the motor truck and its ability to serve the public. It undoubtedly quieted the fears of many children who were afraid that Santa Claus would not get down the chimney at the appointed time because of last-minute orders by their parents.

Again, during the summer months many customers of the department stores migrate to the summer resorts surrounding their particular cities, where they demand a service which can only be economically provided through the use of motors. This service was made good use of by R. H. Macy & Co., New York, who in a recent advertisement in one of the New York dailies showed the Macy store at the center of a circle of 200 sq. miles in area in which it delivers during the summer months. It delivers to the north as far as Ossining and Mt. Kisco, N. Y., and Stamford, Conn., respectively 32, 34 and 32 miles; to the south as far as Spring Lake, N. J., 42 miles and the southeast as far as Morristown, N. J., 30 miles.

Another particularly good example of the proper manner in which to associate trucks with the goods which they deliver is shown in the illustration of the Loose-Wiles truck at the bottom of this page. This truck, one of a great fleet, is painted a sunshine yellow to associate it with the Sunshine biscuits made by the company in its Sunshine bakeries.

All of these examples show how particular merchants have made use of the service which they have been able to offer as a result of using motor trucks as an advertising medium. Every truck owner can do likewise to advantage, no matter what his business.



Another example of association of the truck with the goods which it carries. This is a G. M. C. truck painted a sunshine color, in keeping with the Sunshine biscuits made by the Loose-Wiles company and delivered by the vehicle shown

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Let Uncle Sam Build His Own Trucks

LET the United States Government build its own war trucks.

Radical, you say? Yes, of course it's radical. But remember every forward step in the world's history has been radical.

Foolish, you say? No. On the contrary, such a plan would be decidedly practical and have many advantages which our cousins across the sea have preached to us about, but which we in our ignorance have been unable to work out satisfactorily.

When the eminent French and British war commissions came to our shores they told us that this war was a struggle of nations not mere armies. They told us that our industrial life must go on uninterrupted, although changed to meet the conditions of war. They told us that this uninterrupted industrial life was of the greatest importance in order that the home country might not be thrown into a state of chaos which would reflect on the troops in the trenches when the industrial output was reduced as a result of the unstable home conditions.

Now, one of the greatest branches of our industrial life to-day is mechanical road transportation. While we all recognized the truth of and the reasons for the British and French assertions that our home industry should not be entirely disorganized by our unguided patriotism, one of the first things our government did was to start working out specifications for army motor trucks, the like of which had never been built in any country in the world.

If this was not sufficient, it was further planned that our truck makers should drop all or a greater part of their commercial business which had been secured by years of hard work and turn out these unheard-of army motor trucks, in order to assist in the cause of making the world safe for democracy.

It is decidedly difficult to imagine of any one other thing which would have thrown our truck industry into a greater state of chaos than this plan. Yet that is what was planned, notwithstanding all of the warnings which had been drummed into our ears by those from across the seas and the utmost importance of truck transport as learned from hard European war experience.

Then one of our foremost engineering societies took it upon itself to work out these specifications for the government and produced a set of requirements which has already been found to contain many flaws. These specifications are now being revised, but the plan still remains to have these trucks built by private concerns.

It is of course impossible for private companies to produce trucks built to either the present specifications or the revised ones in time to meet the present emergency, and the Quartermaster's Department is to be congratulated on its wisdom and common sense in accepting bids from truck makers on the vehicles they now build.

These will fill the present breach. But why burden our makers by requiring them to change over their entire facilities for the standard army trucks to be furnished later? General talk notwithstanding, most of the truck makers who presented bids for army trucks did so more as a matter of patriotism and duty rather than a desire to get additional business. The commercial truck business has never been better than it is to-day. Many truck companies simply put in bids for government vehicles in the hope that such service would enable them to get materials more readily for that portion of their output going to commercial service.

In any event, building special war trucks differing materially from standard commercial practice will seriously upset the output of the concerns which make them and lead the industry into that state of disorganization which everybody says we should avoid in these strenuous times.

Besides, the building of these special war trucks is more a question of parts than it is of building a completely-manufactured product. Why not then let the government decide the characteristics of these parts, buy them direct from the parts makers and assemble the truck itself?

This course would not disorganize our present truck industry. It would not require any large outlay of plant, for assembled trucks can be put together readily. It is simply a case of production and several men are available for such a position. Again, many of the passenger car parts makers who are now looking for business because of the decreased passenger car sales would be only too willing to handle some of this work in conjunction with the present truck parts makers who would have to bring out special parts anyway to meet the government's needs.

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Packard Truck Makes 1540-Mile Haul

5-Tonner Used by Goodyear Over Boston-Akron Route

AKRON, June 25—A 5-ton Packard truck used by the Goodyear Tire & Rubber Co. for the past three weeks over a 1540-mile route between this city and Boston has successfully demonstrated its ability to substitute for railroads. The truck has been running on regular schedules over set routes, covering the eastern branches of the Goodyear company and on the return trip taking cotton fabric shipments from the Goodyear cotton mills, Goodyear, Conn. The round trip has been covered in 7½ days. The truck, so far, has made four round trips.

The truck has a special body containing a sleeping compartment back of the driver's seat, running the full width of the cab and containing a comfortable bunk, which is used by the two drivers in relays. This makes it possible to drive the truck 24 hr. a day, making stops necessary only for meals, supplies and cargo. Freight is carried back of the sleeping compartment on a body of the stake type covered with a large tarpaulin bearing the words, "Akron-Boston Express."

MOTOR TRUCK CLUB CHANGES MEMBERSHIP

NEW YORK, June 20—The membership requirements of the Motor Truck Club have been changed so that trade members and others interested in motor trucks are now eligible for membership along with the actual owners or operators of trucks. Heretofore only owners could hold membership.

BARNSDALE PERFECTS SUPERHEATED MANIFOLD

SUPERIOR, WIS., June 18—J. G. Barnsdale, chief engineer and general manager of the Continental Motor Truck Co., Superior, Wis., which is contemplating work on its new plant, has perfected a new design of superheated manifold, combining intake and exhaust pipes, for motor vehicles, making the use of kerosene and the heavier distillates of petroleum possible with the ordinary carbureter. The first design is one for Ford cars.

STANLEY DECLARES REGULAR DIVIDEND

NEWTON, MASS., June 21—The Stanley Motor Carriage Co. has declared its regular dividend on its preferred stock at the rate of 7 per cent, payable July 1 to stock of record that date. Deliveries of Stanley vehicles for the past six months show an increase of 20 per cent over the same period a year ago.

BIDS LOW FOR OHIO LICENSE TAGS

COLUMBUS, OHIO, June 25—The Ellwood-Myers Co., Springfield, Ohio, and the Scioto Sign Co., Kenton, Ohio, are the lowest among six bidders for the 1918 tag contract. The award will not be made for several days.

On tags with 4-in. numerals, the Ellwood-Myers bid is 19½ cents and the Scioto Sign bid 19¾ cents per pair of tags. For tags with 3-in. numerals, the Scioto Sign bid is 16 cents and the Ellwood-Myers bid 16 7-10. Tags for next year will be battleship gray with black numerals.

COMMERCE HAS POST OFFICE CONTRACT

DETROIT, June 18—The Commerce Motor Car Co. has received a contract from the Government to supply the Post Office Department with ¾-tonners for the coming year.

REO WINS VALVE PATENT SUIT

LANSING, MICH., June 18—The Reo Motor Car Co. was completely exonerated by a patent decision handed down by Judge Hazel of New York June 13 in the case of William Barber *vs.* the Reo Motor Car Co., who sued for $1,500,000, claiming infringement of his patent covering a valve construction.

EXCLUSIVE FORD ACCESSORIES SHOWS

CHICAGO, June 22—At a meeting held here this week plans were laid for financing a national exposition for Ford accessories. The organization will direct shows throughout the country at which will be exhibited accessories made especially for Fords. The first show will be held in this city in September and others in the principal cities will follow.

MULTIBESTOS FOR GOVERNMENT

WALPOLE, MASS, June 23—The Standard Woven Fabric Co., maker of Multibestos brake lining, clutch rings, tapes, compounds, etc., has enough stock on hand to enable it to offer prompt delivery to the Government at special prices.

STERLING SELLS CHICAGO BRANCH

CHICAGO, June 16—Sterling Motor Truck Co.'s branch in Chicago has been sold to the Wilcox-Franklin Co. Mr. Wilcox and Mr. Franklin are the principals of the Foote Concrete Machinery Co., manufacturer of concrete mixers, of Chicago.

CAMP WILSON HAS MODEL TRUCK REPAIR SHOP

SAN ANTONIO, TEX., June 17—The largest and most modern motor transport shops of the United States Army are located at Camp Wilson, near this city. The shops are built of steel, iron and glass in such manner that they can be dismantled very quickly. The plant employs 150 skilled mechanics. It is equipped with the newest machinery and amply supplied with spare parts, bought direct from the factory. Seventy-two vehicles can be repaired each day.

CHAMPION PLUGS TESTED BY GOVERNMENT

FLINT, MICH., June 26—The Champion Ignition Co. has received orders for sample spark plugs from the Government. The plugs are to be given severe tests for aviation, passenger car and truck service.

How Trucks Can Help Our Railroads

This Magazine Outlines a Plan Now Advised by the Gov't

NEW YORK CITY, June 28—The manner in which motor trucks can help the railroads in our present national crisis, as pointed out in the editorial in the June 1, 1917, issue of THE COMMERCIAL VEHICLE, has been adopted by the United States Department of Commerce, which recently sent out 7000 letters to chambers of commerce and other commercial organizations throughout the United States urging co-operation from all quarters to relieve the present railroad congestion.

The suggestions contained in this letter are as follows:

> "Unloading promptly of all loaded cars received; to load promptly all outgoing cars and release them immediately to the railroad; anticipate the disposition of freight before its arrival; do not order special types of cars when ordinary types will serve; *eliminate the use of railway equipment in trap or tramp cars when the tonnage can be handled by motor truck or wagons;* load all cars to their full carrying capacity, so that the maximum use of each car will be obtained."

RIVER ROUGE BILL PASSED

WASHINGTON, D. C., June 18—The House of Representatives has passed a bill which directs the immediate development of the River Rouge to enable boats to reach the proposed new Ford blast furnaces. Secretary Baker, who was in favor of the bill, mentioned the importance of the tractor as a means of increasing food production in connection with the river improvement and also pointed out specifically the saving of transportation as a feature which makes this work imperative.

RECOMMEND WAR ROAD BUILDING

NEW YORK, June 25—A meeting held at the Automobile Club of America passed a resolution urging that the highway departments of the States co-operate with the War Department in the investigation of highways and the building of roads which will be of greatest value. The transportation of products makes certain highways important. It was also suggested that railroads should not be permitted to place an embargo on road building machinery and materials.

SEAGRAVE ASSETS TOTAL $196,767.84

WALKERVILLE, ONT., June 22—W. E. Seagrave & Co. have made a statement to their creditors showing assets of $196,767.84 and liabilities of $76,849.70. In order to complete the contracts now under way, the company plans an increase in capital by means of the incorporation of the business and the provision of funds for working capital through the sale of preferred stock. Upwards of $50,000 was spoken for by those present at a recent meeting at the factory to discuss the matter. It is intended to use the first money received to pay the merchandise creditors.

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Truck Opportunities Good in Chile

Nitrate Business in Need of Better Transportation

SANTIAGO, CHILE, June 20—Chile offers many opportunities for the sale of trucks, according to Federico H. Tonkin, of this city, who is now in New York to establish himself as a specialist in Chilean export and import business. The use of trucks in the nitrate business here to replace the carts now in use offers large opportunities for sales, as pointed out in THE COMMERCIAL VEHICLE of Nov. 1, 1916. The nitrate business has grown very rapidly. There are now 140 nitrate factories. In the nitrate country, in the north of Chile, the nitrate is blasted in large blocks from the earth and then must be transported to the crushers before it is boiled. At present much of this haulage is done on two-wheel carts and on small railroads.

OPPORTUNITY FOR TRUCK SALES IN RUSSIA

NEW YORK, June 26—Immediate advantage should be taken by American truck makers of the opportunities for sales in Russia, states H. W. Wesener, special representative for the Firestone Tire & Rubber Co., just returned from one year's stay in Russia. They should not wait until after the war, he says, because England, France, Sweden and other European countries will have become too firmly intrenched.

The country offers marvelous opportunities for development along transportation and industrial lines. Eighty per cent of its population of 175,000,000 people are engaged in agricultural or kindred pursuits.

MILWAUKEE MAKERS SEEK FOREIGN TRADE

MILWAUKEE, WIS., June 18—The Merchants and Manufacturers' Assn. of Milwaukee, recently reorganized to accommodate a membership increased from 1400 to 4000 individuals and firms, has undertaken the organization of a foreign trade bureau which will seek business all over the world. The firms identified with the motor truck industry which are represented on the special committee to carry out the plan include: Auto Parts Mfg. Co., Sterling Motor Truck Co., International Harvester Corp., A. O. Smith Corp., Stegeman Motor Car Co., Wadhame Oil Co., Wisconsin Motor Mfg. Co., and the Kempsmith Mfg. Co.

JAPAN A POTENTIAL MARKET FOR TRUCKS

TOKYO, JAPAN, June 1—The time is not far distant when Japan will become a big market for motor trucks. Several importers are now contemplating the active exploitation of trucks and light delivery cars. Manufacturers are taking every advantage of the new markets opened to them and as rapidly as possible are adopting foreign methods of manufacture. There are only twenty-one trucks in the whole empire. Probably 95 per cent of the work is manual.

At present there seems to be some feeling that the truck will take the coolie's job away from him. And then again there are other obstacles in the way of truck sales. For instance, there is the high cost of gasoline and the narrow streets in old sections of the cities.

In regard to coolie labor, the great bulk of goods transportation is by man power, from towering carloads of light merchandise drawn by boys of 8, 9 and 10, to uncut timber, steam boilers and heavy machinery hauled by the huskier adults. The coolie works for 20 to 30 cents per day.

NEW BUICK LIGHT DELIVERY

FLINT, MICH., June 27—The Buick Motor Co. will bring out for 1918 a light delivery vehicle, Model E, with a Buick 3⅜ by 4¾ in. valve-in-head engine, selling at $790, with an open express type body, canopy top and side curtains. It has a loading space of 42½ by 70 in. and a carrying capacity of 500 lb. The body is finished in dark green, while the fittings, hood, radiator, fenders, skirt, wheels and chassis are black. The wheelbase is 106 in. Thirty-five brake horsepower is claimed for the engine. The rear axle is of the three-quarter floating type. Tires are 31 by 4 in., clincher, nonskid. The cooling system, lubrication, carbureter, ignition, starter, clutch, gearset, control, drive, brakes, etc., are the same as on model E 4-34 passenger car.

BRISCOE MAY BUILD TRUCKS

JACKSON, MICH., June 25—The manufacture of a new light delivery truck, it is rumored, is being planned by the Briscoe Motor Corp. The new Briscoe truck, it is stated, will incorporate in its chassis some of the Redden truck attachment features, using a Briscoe engine.

NEW MODELS FOR DENNEEN

CLEVELAND, June 18—The Denneen Motor Co., maker of the Denmo truck, is now making the following models: ¾-ton, model 12, three different types of bodies, $995, $1,020 and $1,065; 1¼-ton, model 10, chassis, $1,490; 2-ton, model 15, chassis, $1,790, and the 3-ton, model 14, at $2,325.

FIRST AUTOMATIC TRAILER OUT

COLUMBUS, OHIO, June 23—The Automatic Control Trailer Co., with offices in the Hartman Building, has just turned out its first trailer, which has been sold to the Crystal Soda Water Co., Buttles avenue. Officers of the company are S. A. Kinnear, president; Charles Seaman, vice-president; John T. Price, secretary-treasurer.

Coming Events

July 17.....	Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.
July 18.....	Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.
July.....	Sixth Annual Outing of the New York Division of the Motor Truck Club of America at Karatsonyi's Hotel, Glenwood Landing, L. I.

Five New Kissel Models Brought Out

Longer Wheelbase and Loading Space—All-Year Cabs

HARTFORD, WIS., June 24—A longer wheelbase and loading space and the all-year cab are the outstanding features of the new line of Kissel trucks brought out by the Kissel Motor Car Co. These consist of the Flyer, with a chassis capacity, including body, of 2250 lb., costing $1,085; the General Utility, capacity 3400 lb., at $1,485; the Freighter, capacity of 5200 lb., at $2,100; the Heavy Duty, capacity 8600 lb., at $2,950, and the Dreadnaught, capacity 11,800 lb., at $3,750.

The first model, formerly termed the ¾-tonner, has been increased in wheelbase from 120 to 135 in. and with an 8-ft. loading space instead of 6 ft. 3 in. The next model has its wheelbase increased from 132 to 152 in. and a loading space of 10 ft. instead of 8 ft. The third model has a 168-in. wheelbase instead of 144 in., and a 12-ft. loading space in place of 10 ft. The two largest models, the Heavy Duty and the Dreadnaught, have wheelbases of 168 and 180 in., respectively, and 13 and 14-ft. loading space.

The first two models have 3⅞ by 5½-in. Kissel engines, giving 24.2 hp., S. A. E. The last three have 4¼ by 5½ in. Kissel engines, giving 29 hp., S. A. E.

The Flyer has a special bevel gear drive, while the other four models are equipped with worm drive.

LANE MAKING NEW TRUCK

KALAMAZOO, MICH., June 16—The Lane Truck Co., of this city, is manufacturing a 3½-ton truck, selling at $3,000. The company will also engage in the manufacture of a 1½-ton truck in the near future.

WILL MAKE TRUCK ENGINES

MINNEAPOLIS, MINN., June 14—The Minneapolis Steel & Machinery Co. is spending $325,000 for additional plants where it will manufacture engines for trucks and tractors.

REMY BROTHERS TO BUILD TRACTORS

KOKOMO, IND., June 23—The Remy Brothers Co. has been formed to manufacture tractors. The company consists of interests connected with the Haynes Automobile Co. and the two Remy brothers, Frank and Perry. The plant will be in this city. Frank Remy has been elected president and Perry, secretary and treasurer. Richard Ruddell, president of the Citizens' National Bank, is vice-president.

The board of directors consists of J. W. Johnson, Kokomo Brass Works, and A. A. Charles, Kokomo Steel & Wire Co. Among the stockholders are A. G. Seiberling, general manager of the Haynes company; Elwood Haynes, its president; R. H. Conrad, Kokomo Bale Tie Co.; A. V. Conrad, Great Western Pottery Co.; King Kennedy, merchant, and A. B. Armstrong, Superior Tool Co.

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May Truck Exports Show Increase

1440 Sent Across — England Our Largest Buyer

NEW YORK, June 22—May truck exports were much improved over the previous month. During that month most of our truck exports went to England. The total value of her purchases amounted to $1,858,270. The total truck exports from this port during May amounted to $2,590,352, numbering 1440, compared with $2,961,389 and 1040, respectively, in May, 1916.

290,372,215 GAL. GASOLINE EXPORTED

NEW YORK, June 23—Gasoline exports in the nine months ending March, 1917, totaled 290,372,215 gal., an increase of 81,138,286 gal. as compared with the period ending March, 1916, when the total was 209,233,929. Special precautions were taken to guard gasoline shipments from submarines.

FEDERAL TRUCK PRICES RAISED

DETROIT, June 26—The Federal Motor Truck Co. has increased the prices of its models as follows: 2-ton, $150 increase; 1½-ton, $100 increase; 2-ton and 3½-ton, each $150, effective at once.

REPUBLIC ¼-TONNER $100 HIGHER

ALMA, MICH., June 18—The Republic Motor Truck Co. has advanced the price of its ¾-ton truck $100 and will advance all other models as soon as the costs are definitely estimated.

STEWART RAISES PRICES

BUFFALO, N. Y., June 23—The Stewart Motor Corp. has raised its prices on the 1500-lb. chassis from $795 to $845 and on the 2-tonner from $1,975 to $2,100. Both the 1 and 1½-ton chassis models remain unchanged.

TITAN MOTORS PROGRESSING

DETROIT, June 22—The Titan Motors Corp. has taken a portion of the Bour-Davis plant and placed a corps of draftsmen to work. A. A. Glootner, of the company, who returned from Washington this week, has reported excellent progress and states that a motor for trucks designed for the Government is to be manufactured at the Titan plant.

FORD BUILDING TIRE PLANT

DETROIT, June 25—Included in the various buildings being erected at the River Rouge by Henry Ford will be a very large unit devoted to tire manufacturing. Tires made in this factory will be manufactured exclusively for Ford cars.

GUARANTY SECURITIES INCREASES RATES

NEW YORK, June 25—The Guaranty Securities Corp. has readjusted its schedule for handling its time-payment business. The new rates, effective June 15, apply to the handling of accommodation for both passenger cars and trucks. Interest rates on certificates of deposit have been advanced uniformly 1 per cent under each of the five purchase plans, while the minimum charges have been advanced in four instances, the lowest now being the $15 minimum for passenger cars purchased under plan A, which remains unchanged; and the highest $30 under plan E, which applies to the purchase of trucks, and returns to the dealer the full amount of the list price upon completion of the transaction. This minimum was formerly $20.

SELDEN TO INCREASE PRODUCTION

ROCHESTER, N. Y., June 23—The Selden Truck Sales Co. is arranging to increase its production. The company recently declared a special dividend of 5½ per cent on its preferred stock.

SANFORD TRUCK REORGANIZED

SYRACUSE, June 23—The Sanford Motor Truck Co. has been reorganized and active control placed in the hands of E. A. Kingsbury, E. A. Dauer and J. E. Gramlich, all previously connected with the Chase Motor Truck Co. The company will market an entirely new line of trucks, including 1 and 2-ton trucks with internal-gear drive and 2½, 3½ and 5-ton worm-driven models. The personnel of the new Sanford company follows: President, J. F. Durston; vice-president, C. Hamilton Sanford; secretary-treasurer, F. F. Sanford; general manager, E. A. Kingsbury; general sales manager, E. A. Dauer; chief engineer and designer, J. E. Gramlich; assistant engineer, W. F. Hinnelsbach.

REO HAS LARGE MATERIALS STOCK

LANSING, MICH., June 25—The Reo Motor Car Co. has purchased enough materials to meet the company's needs up to January, 1918, and will this year turn out 100 per cent more trucks than in 1916 and 5000 more passenger cars than in the preceding 12 months. The company has orders on its books for more than 8000 passenger cars and a large number of trucks.

WAGNER-HOYT TO LEAVE FIELD

NEW YORK, June 25—The Wagner-Hoyt Electric Co., organized in June, 1916, has gone into bankruptcy. All of its merchandise, fixtures and machinery will be sold at public auction at the factory and salesroom, 1902 Broadway, July 2. The sale will be held under the supervision of the Supreme Court of New York.

5% TAX ON ADVERTISING

WASHINGTON, D. C., June 27—The Senate finance committee, considering the revenue bill, has adopted a provision fixing a tax of one-fourth of 1 cent per lb. on second-class postage and a tax on advertising of 5 per cent, with an exemption up to $4,000.

ATTERBURY PRESIDENT DIES

BUFFALO, N. Y., June 22—J. B. Pierce, president of the Atterbury Motor Car Co,. died to-day at his summer home in Lynnfield, Mass.

Exports Under Control of Government

President Assumes Authority Over Foreign Trade

WASHINGTON, D. C., June 25—President Wilson has signed an order authorizing the creation of an Exports Council, under the powers vested in him by the espionage law. He thus assumes authority and control over all exports to foreign countries. The Exports Council will be merely advisory to the President, and there will be no prohibition of the normal flow of exports.

The President, however, has the authority of determining what this nation or that shall have of the products of the United States, and can stop or regulate the export of grain or other commodities to any neutral country which permits any of its supply from America to reach Germany.

The United States Government will have twenty agents in the European countries who will aid in determining the quantities of our products which each of the allied or neutral countries need, and to make full reports concerning conditions abroad, which will aid in the guidance of the Exports Council.

The whole object of the council will be to direct exports in such a way that they will go first and by preference where they are most needed and most immediately needed, and temporarily to withhold them, if necessary, where they can best be spared.

Secretary of State Lansing has been authorized to take such measures as may be necessary to administer and execute the President's order and to grant or refuse export licenses thereunder, in accordance with those instructions.

ATCHISON SHOULD BE ACASON

NEW YORK CITY, June 22—In the complete bids for army motor trucks, published on page 15 of the June 1 issue of THE COMMERCIAL VEHICLE, the Acason bid was confused with a make of truck given as the Atchison due to the inability to confirm the spelling before going to press. The Acason Motor Truck Co., Detroit, placed bids for a total of 750 trucks at the rate of fifty per month with a price of $2,400 on the 1½-ton type and $2,900 on the 3-ton model, both bids being on the Acason company's specifications.

PACKARD DEALERS ON SAIL

DETROIT, June 18—More than 600 representatives of the Packard Motor Car Co., with their families, left Detroit today on board the Steamer Noronic for a three-day cruise. The Noronic carried the dealers and their wives through several of the Great Lakes and returned here on June 21. These dealers were the winners of the Lincoln Highway Sales Sweepstakes conducted by the Packard company. The winners were awarded hand-carved hall clocks. Thousands of dollars worth of exhibits of new models of cars and trucks were on the main deck. Appropriate decorations were installed, and the large dance hall on the ship was converted into a convention hall. Slogans and statistical charts were hung prominently about the boat.

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Standardized Trucks for Army

Parts Makers and Engineers Convene to Discuss Matter

WASHINGTON, June 27—An informal meeting of about fifty truck parts makers and truck engineers was held at the Bureau of Standards this morning and consisted mainly of explanations as to just what is being attempted in army truck standardization. John Younger suggested that standardizations should be carried to the utmost limit while the committees are about it. There was expressed a strong desire that these meetings be made more formal, that the whole committee and the whole society be advised of what is being done in order to get the widest co-operation.

Many present obviously felt that things were being done under cover. H. L. Horning, who was in the chair, explained that this was entirely mistaken; the informality was a result of doing the work the War Department required with the utmost speed. It was eventually decided to break up the meeting into sections, which immediately convened for discussion of engines, transmissions, axles, radiators, etc. Probably a meeting of a more formal sort will be held in the Middle West within two weeks, at which time absolute finality should be reached. It was decided that the truck standard division and perhaps some other chassis builders should have the findings of the sectional committees submitted because it was generally agreed that interchangeable designs which would really fit could not be produced by parts committees working individually.

REO TRUCKS REQUISITIONED

LANSING, MICH., June 16—The United States Government gave compulsory orders to the Reo Motor Car Co. this week for ¾-ton trucks for shipment to Tacoma, Wash., where one of the biggest of the Government's war enterprises is now in full swing. The reports from Tacoma show that the Government has acquired a vast acreage along Puget Sound. These quarters must be in shape by Sept. 1, when 40,000 men will be centered at this point. Other requisitions by the Government received by the Reo company this week were for trucks for Fort Snelling and Fort Sheridan.

G. M. C. AMBULANCES FOR U. S. ARMY

PONTIAC, MICH., June 26—The General Motors Truck Co. has received an order for 1000 ½-ton chassis for ambulances in the Medical Corps of the United States Army.

FORD RUSHES AMBULANCE ORDER

DETROIT, June 19—The Ford contract for 2400 ambulances for the United States War Department and involving $1,500,000, is being rushed to completion by the Ford Motor Co.

PIERCE MAKING ARMY TRUCK

BUFFALO, N. Y., June 25—The Pierce-Arrow army truck, built to conform exactly with the War Department specifications, is being assembled at the plant of the Pierce-Arrow Motor Car Corp., the engine being now on the block. It is hoped to have the truck on the road by the end of the week.

John Younger, chief engineer of the truck department, states that the specification has worked out extremely well, and that he considers the truck to be nearly perfect for military work, though, of course, too powerful for its size for commercial purposes.

It is understood that the Pierce-Arrow company does not plan to build this truck for other than military work, but that it is prepared to produce any quantity that the Government may call for, if necessary turning over the major portion of the plant available for truck manufacture.

PACKARD AIDS U. S. TO GET DRIVERS

DETROIT, June 19—The Packard Motor Car Co., co-operating with the United States Government, is advertising for drivers and competent mechanics for the motor truck division of the United States army and for foreign service, by opening its employment department to applicants for such duties. The company is publishing advertisements daily in the newspapers to further this work.

AMBULANCE ASSEMBLY AT KENTUCKY WAGON PLANT

LOUISVILLE, KY., June 17—Motor ambulances hereafter bought for the United States Army will be assembled at the Kentucky Wagon Mfg. Co., Louisville. The contract between the Government and the Louisville concern covers a period of years and specifies several thousand cars per annum.

The parts of the ambulances, made by many factories, will be shipped to Louisville for assembling. The work will require the employment of scores of expert mechanics, in addition to those already connected with the Kentucky Wagon company.

ARMY INSPECTS TONFORD

DETROIT, June 18—Captain Renwick, U. S. A., who is now somewhere in the East following an inspection of motor car and parts plants in the Middle West, is said to be in favor of the use of Tonford truck units combined with the Ford power plant for use in connection with a "flying regiment." The regiment would combine armored cars and a motorcycle detachment. Captain Renwick stated that he proposed the use of the 100 Tonfords with trailers as the principal mechanical component of the regiment, and estimated that each Tonford with trailer would carry 32 soldiers. The Detroit Truck Co., which manufactures the Tonford unit, will have a sample army truck completed shortly for Captain Renwick's inspection. The truck and the trailer will have the seats back to back.

WALL IN CHARGE OF ARMY TANKS

INDIANAPOLIS, June 17—William Guy Wall, vice-president and chief engineer of the National Motor Car & Vehicle Corp., has been selected by the War Department to assume charge of designing and producing armored cars and tanks for the army.

Lapier Tractor-Truck on Market

Waukesha Engine — Price $1,900 and $2,000

LAPIER, MICH., June 18—The Lapier Tractor-Truck Co. has placed on the market a tractor-truck, in two models, each with a Waukesha four-cylinder 3½-in. bore by 5¼-in. stroke engine, and selling for $1,900 and $2,000. The 3-ton type is furnished as a complete tractor with a cab and trailer without the body for $1,900 and the 5-ton model, which includes the complete tractor with the cab and trailer, without the body is $2,000.

The tractor-truck engine has a separate head, three-point suspension, cylinders cast in block, three main bearings, and built in governor. Lubrication is by pump and splash. Cooling is provided by a centrifugal pump, radiator and fan. The clutch is a multiple-disk, dry-plate type. A unit powerplant transmission with selective gearset with three speeds forward and one reverse is provided. The propeller shaft is of the two-universal joint type. The Torbensen internal-gear-driven rear axle is used. Contracting foot brakes and expanding hand brakes operate on the rear wheels. Fixed spark advance and high-tension magneto ignition is provided. Wheels are of wood, 34 by 4 front, 34 by 5-6 rear with solid tires. Left hand side steer is used. The frame is of 5-in. channel steel. The wheelbase is 90 in.

FORD GIVES $500,000 AMBULANCES

DETROIT, June 22—The Ford Motor Co. has given 1000 Ford ambulances valued at $500,000 to the American Red Cross.

GENERAL MOTORS GIVES $250,000

FLINT, MICH., June 22—The General Motors Co. yesterday voted $10 to the Red Cross fund for every employee.

The Buick and Weston-Mott companies here will subscribe $125,000. The Cadillac and Northway companies of Detroit will subscribe $75,000; the Oakland and General Motors Truck companies of Pontiac, $25,000; the Olds company of Lansing, $15,000, and the Jackson-Church-Wilcox Co., Saginaw, $10,000.

CHURCH TALKS ON MOTOR TRUCK MANUFACTURE FOR WAR

CLEVELAND, June 25—H. D. Church, chief engineer truck division of the Packard Motor Car Co., Detroit, recently delivered a paper before the local Engineering Society, in which he brought out the results of his observations under actual military conditions of faults in the design of the military trucks. Mr. Church took up the pulling power of trucks and laid much emphasis on the fact that strength is more important in the make-up of a truck for war service than is lightness. According to Mr. Church there is an absolute necessity for governors on the engines, not only to limit the maximum vehicle speed on high gear, but also to limit the maximum engine speed on any of the gears. He found the heat-dissipating ability of the average radiator inadequate. He believes that a 50 per cent increase in the cooling ability would not be excessive.

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Washington S. A. E. Meeting Greatest in the History of Recently Enlarged Body

First Ever Held Under New Automotive Name—Attendance Large—Truck Subjects Play Important Part in 2-Day Work

WASHINGTON, D. C., June 26—The most successful summer meeting ever held by the S. A. E. was closed here to-day at the Nation's Capital after 2 days devoted to discussions of subjects of vital moment to the government. The session will also go down on the records as one of the best attended, and was also the first ever held under the new name of the Society of Automotive Engineers.

In keeping with that new name, the matters discussed included motor trucks and passenger cars as well as airplanes, farm tractors and submarine chasers.

The growth of the society to its present membership of 3030 was no doubt the reason for the greatest attendance at a Standards Committee meeting ever held. The standardization work occupied the morning and afternoon sessions of the first day of the meeting and also the morning of the second day. In the afternoon of the latter, the various papers were presented and the conclave closed in a blaze of glory at the annual dinner held in the Hotel New Willard.

While these scheduled activities were going forward, there was much other important work being carried on, such as for example informal meetings of truck and parts makers in an attempt to further simplify the specifications for the standard army motor trucks. Many meetings of this nature were held but nothing definite has been accomplished as yet. It is certain, however, that the army truck specifications as printed in full in the May 1, 1917, issue of THE COMMERCIAL VEHICLE will be revised to a considerable extent before any standard army trucks are built.

Another important step to be taken by the War Department is its intention to call for new bids on bodies such as can be used on the standard makes of trucks that will be purchased for emergency use before the standard truck design is completed.

Perhaps of greatest moment to the man interested in motor trucks was the paper to have been read by W. O. Thomas on the Lessons of the War in Truck Design and its possible bearing on the construction of the commercial truck of the future. Mr. Thomas's paper brings to light many unusual sidelights on the work of our trucks in the war and the high spots of his experience are briefly summarized on the next page. Mr. Thomas's paper is of such length that lack of space will permit only a portion of its being printed in this issue. The remainder will appear in the next issue.

High Lights *in* Motor Trucks *at the* S. A. E. Meeting

Unusually excellent paper on the LESSONS OF THE WAR IN TRUCK DESIGN, by W. O. Thomas. The paper was not read, due to lack of time, but is printed in part herewith.

Informal meetings by truck and parts manufacturers to revise and further standardize the proposed U. S. Army truck.

New army truck body bids to be asked for to accommodate such conventional trucks as are purchased before the standardized type is more fully decided upon.

Adoption of various S. A. E. standards.

Unusually large attendance at the Standards Committee meetings at the Bureau of Standards.

Full-capacity attendance of 700 at the annual dinner at the New Willard Hotel.

Lessons of the War in Truck Design

By W. Owen Thomas

THE trucks used in France by the British Army at the beginning of the war were mostly of the commercial type, not especially designed for war service. This was true of the trucks made in Europe as well as those sent from America. A very small number of the so-called subsidized British War Office pattern had been built; the majority were taken out of regular commercial service. Many of them had been in use as omnibuses by the London General Omnibus Co. and the bodies were replaced by others quickly built to meet the emergency. Some of the European-built trucks were fitted with four-speed transmissions of the commercial type, mainly to permit the use of smaller engines and greater fuel economy.

The greater part of the English and American trucks were divided into nineteen different makes and forty-two different models of widely varying design, so that the problem of providing spare parts and maintaining the trucks in service soon became very great. The makers were working overtime producing new trucks and there was a consequent shortage of spare parts.

My first study of the maintenance problem showed that some vehicles had been out of service from 3 to 5 months and that a large number of one make of American trucks, which was in general giving good satisfaction, were out of commission, on account of shortage of clutch thrust collars, gear shifts, fan bearings and front wheels. It was soon evident that the majority of the troubles were not with the main points of design but with gear ratios and other minor details.

Many trucks were too low geared on high to stand the test of high engine speeds in emergency and these naturally developed engine trouble, broken crankshafts, etc. All of them were too high geared on low and reverse to operate successfully under the bad road conditions which the German shells were constantly rendering worse with the co-operation of the heavy rains and floods.

It must not be supposed that an ideal war truck should be something not adapted to general service conditions. The constant heavy duty under which the war truck is operated must produce a simpler, more reliable and more easily maintained truck for use under ordinary commercial conditions. The war truck is generally driven by a man who has never driven a truck before and who probably has never even driven a passenger car. He is recruited as a soldier and afterward trained as a mechanical transport driver. In the English amy he is a private in the Army Service Corps, and the officer over him is also likely to be new at the truck game.

The Army Service Corps in England deals mainly with the

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problem of feeding the men and horses of the army. The transporting of the food came under an Army Service Corps officer called the Director of Transport and Supplies, and the transport work by horses meant principally the addition of a little more forage. When the horse transport was superseded by motor trucks the system still remained under the control of the same officer, although he had very little mechanical experience. The problem gradually changed to one of mechanical operation and maintenance, but in the English army the administration of it is still an adjunct of the commissary.

In the French army before the war the use of motor vehicles was much further advanced and was part of the artillery command. The officers in this command were technically trained and well equipped for the problem, but in both the English and French armies it was necessary to call in men who had had previous engineering experience in motor truck subjects. Personally I can see the need of keeping the mechanical transport operation and maintenance separate from the older departments of the army, although it might be possible to combine the maintenance facilities of the passenger car, motor truck and aero sections.

The training of the army personnel in the use of mechanical transport is important in order that the trucks in use may be properly operated and maintained. The men, like the trucks, need steady reinforcements and replacements amounting to 3 per cent per month even after the army is complete in the field. Besides the training of these additional men 2 months' reinforcements must always be available at the advanced base, and 2 months' reinforcements at the base, where they can undergo additional training until they are called.

The training of a transport private or officer takes about 3 months outside of their training as soldiers. It is necessary to divide the training of both into three distinct parts: First, the ordinary school or book knowledge of the subject in the Mechanical Transport School; second, driving and operation; third, system of maintenance and repair. I am satisfied that a thorough training of the personnel more than pays for itself in the condition of the equipment afterward, and that what has been found necessary in this direction should be given careful consideration by the United States Government in building up the mechanical transport division of its army.

American Trucks Have Greater Interchangeability of Parts

It is difficult for the average engineer and writer to compare European trucks at the front with those sent over from America. They are good and bad from entirely opposite standpoints. The European trucks for the main part were better designed in detail and much more refined than the trucks sent from America, but their parts were not nearly as interchangeable and it was more difficult to repair them on account of the hand-fitting which is an essential feature of the system under which they are manufactured. The parts of some of the American cars and trucks were interchangeable to an extent which was beyond the comprehension of the average British or French officer.

To maintain trucks in the field the English army ordered a list of parts for every truck varying from 10 per cent of the total of all of the main units on the trucks in use to 100 per cent of all nuts, bolts, carbureter floats, bearings, washers, brake linings, gaskets, clutch facings, etc. and 200 per cent of all spark plugs, fan belts, hose connections, and so on.

After the trucks had been in service for some time a monthly list was prepared for the parts which experience showed were needed to maintain them in service. This list is known as the 3 per cent list because it contains 3 per cent of all main units in service and up to 100 per cent spark plugs, etc. A stock of these parts equal to a 6 months' supply is carried at the various bases. This stock, besides being added to by the regular 3 per cent monthly list, can draw in emergency from the reserve stocks at the base, which are replenished by special orders.

Two Per Cent of Trucks Replaced Per Month

While 3 per cent of the main units are allowed in an assembled condition each month, all of the separate component parts of these units are also carried in an additional proportion. For instance, crankshafts are an additional 3 per cent, bearings from 10 to 30 per cent, etc. About 2 per cent per month of the complete trucks in service are also replaced with new trucks on account of being beyond repair with new units or parts.

If all of the above allowances for repair and replacement were used up in any given period and charged at the same rate as the parts in the original truck, it will be found that each original truck had been entirely replaced in value after about 8 months' service. Actually, the list of replacement parts is always enough to maintain more than a balance, so that the nominal life of the truck is for a slightly longer period. With this life, the investment for trucks and replacement parts f.o.b. factory averages about $16 per day per truck in service, which for war conditions is a very creditable showing for mechanical transport.

The need of standardization of parts cannot be too strongly emphasized. After going through this problem under actual war conditions it is easy to realize the enormous saving of time and expense in the shipment and replacement of repair parts if the units of the various trucks are rapidly replaceable by having their main dimensions and supporting points standardized. Personally I feel that the standardization should be carried out further than this, as the problem in the field is to quickly repair the unit which has been removed from a truck.

I remember seeing in France 180 cars of one Detroit make, all with the same complaint. They were ready for use except for one gear in the transmission and a condenser. Some of them had never been in service but had been robbed for the repair of others at the front.

On another occasion I was able to supply a differential intended for a touring car axle as a repair for the jackshaft of a fire truck, which otherwise would have been out of service for a long time. In England to-day under government control many companies are using details belonging to other cars and trucks without the necessity of making additional dies or tools. My impression is that much time would be saved by starting out at once to standardize along this same plan.

In order to effectively standardize, the government must assume the responsibility for the design used, for the distribution of the material of the proper quality, and for the manufacture of all forgings and similar parts needing dies and special tools. Such a design should be utilized to an extent not hitherto possible. For instance, the clutch housing should support the clutch-operaing mechanism, the transmission unit should be integral with the gear shift, and all operating mechanisms should be integral with and supported

(*Continued on page* 33)

Important Items of War Truck Design

As Gleaned From First Instalment of Mr. Thomas's Paper

1—Many trucks geared too low to stand the test of high engine speeds in emergencies.

2—Thorough training of army truck driver or convoy officers takes 3 months.

3—American trucks poor in detail refinements, but good in part interchangeability.

4—Truck investment per day in service costs $16.

5—Operating mechanisms such as clutch fittings and gear-shifting devices should be integral with and supported by the units they control.

6—Protection of parts against mud and weather is of prime importance.

7—Good road clearance and sharp turning radius are necessary.

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Our London Letter

By R. Douglas-Vickers

BIG MARKET FOR U. S. 2-TONNERS AFTER THE WAR—INTERNAL-GEAR DRIVERS MAKING HEADWAY—ELECTRICS ARE PROGRESSING

LONDON, ENG., June 1—There have been very steady increases in the prices of American-built commercial vehicles here during the past 9 months or so, due to increasing freight charges and insurance. The difficulty of getting fresh supplies also tends to send up the prices, as, of course, a moderate demand continues for such models as are available. I have just been advised by the Anzac Motor Co., which markets the G. M. C. chassis here, that it has been reluctantly compelled to increase prices to the following figures: 1-tonner, with pneumatic tires all around, $1,800, and with special Goodyear cushion tires on rear wheels, $1,875; 1½-tonner, $3,000; 2-tonner, $3,600, and the 3½-tonner, $4,875. These figures show an increase on previous prices of about $125 per chassis, and I quote them because they are the most typical of those imported from the United States.

I have been making inquiries lately as to the attitude of the importers towards the tariff proposals which are likely to come up after the war as part of our policy, and the views I have had put before me are very interesting. In nearly every case it is taken as a foregone conclusion that a duty of at least 33⅓ per cent will be imposed on all foreign-made trucks, but notwithstanding this I find most of the importers quite optimistic as to their capacity to carry on a successful trade in American chassis, as they contend that they will be able to compete satisfactorily with the British maker unless he reduces his selling price very substantially. They are, I may add, somewhat skeptical as to his ability to do this.

Frankly I do not quite share their optimism for the simple reason that even on their previous outfits British makers could cut prices very materially and still make a handsome profit. To this possibility I would add a simplification of the works' program by the elimination of a number of unprofitable models. This multiplicity of models has been the cause of much dissipation of energy and profit in the past, and I think factory owners will have learned the lesson of a prolonged and almost automatic output of the War Office model which quite fills the bill as a heavyweight commercial vehicle.

Big Market for Small U. S. Trucks

From the foregoing it may be inferred that there will not be serious competition from home factories for the trade in vehicles of 2-ton capacity and under. This class will be tackled seriously by importers, and I should not be surprised if some of them erect assembling factories or manufacture outright on this side. I am told that H. G. Burford & Co. contemplate doing so as soon as hostilities cease, and that will, no doubt, be a lead to others. The Burford 2-ton chassis with internal-gear drive has proved one of the most successful commercial vehicles that have come from the States. Expert observers have frequently drawn attention to its good points and predicted that it has an excellent future before it in this country.

On the subject of vehicles fitted with the internal-gear form of drive it is worth noting that great headway has been made with this type, although no British makers, if we except the British Berna Co., have shown any disposition to take it up. I estimate that there are approximately 1,000 American-built commercial vehicles with this form of drive at work in ordinary trade transport at the present moment. So far as I can learn this number is divided between the Selden, marketed by Gaston, Williams & Wigmore, Ltd.; the Denby, marketed by Whiting, Ltd., and the Burford, marketed by H. G. Burford & Co., Ltd. I ought to mention that there is at least one Republic truck in London which is provided with internal-gear drive, but for some reason or other little attention appears to have been given to this make, which is quite a good one judging by reports that have reached me regarding it. The concessionaries for the Selden vehicle are drawing attention to the fact that they can supply in two models, one of 1-ton and the other of 2-ton capacity, within 2 days after the placing of an order, and I expect this offer will be quickly taken advantage of by firms in need of light transport facilities. So far as the Denby truck is concerned, I gather that where sales have been effected these have in many instances been followed by repeat orders. This is always, and I think rightly, regarded as the best testimonials a user can give to the satisfaction the trucks have given him.

Fuel Shortage Getting Worse

The control of motor spirit is now much stricter and more complete than when the Petrol Committee brought in its licensing scheme last July. Until this month the control related only to gasoline, but a recent order extends the control to all gasoline substitutes, of which there are many on the market, although many of them had a common origin. The principal substitute is, of course, kerosene, and the supplies of this commodity have to be as carefully husbanded as is the case with gasoline. Indeed, I believe that the principal stocks are in the hands of one company, namely, the Anglo-American Oil Co., the vendors of Pratt's spirit.

The restriction of motor imports into

(*Continued on page* 21)



One of the giant airdomes of the British Royal Flying Corps back of the lines in France. One of the speedy American ambulances attached to the corps is seen in the right foreground. Note one of the airplanes on the wing in the left center of the picture. Each of the long row of hangars at the left has accommodation for from three to five flying machines

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The standardized French army ambulance, which is light and speedy, economical to run, and which carries five wounded men who can be loaded comfortably. The comfortableness of the wounded being loaded in an army ambulance is a prime requisite. Wounded men are often hurt more by being lifted into and taken out of an ambulance than by the actual journey

French Develop Ideal Type of Light, Economical and Comfortable Army Ambulance

In It Wounded Troops Do Not Dread Trip to Hospital

By W. F. Bradley

THE development of the present French ambulance type from the previous models which were more or less unsatisfactory in some respects should prove of great value to our own army surgeons. It is also of interest to learn that the American ambulances serving with the French are very much inferior to the French type, and that the glowing reports of what the American units have accomplished have been due more to the great spirit and dash of the American drivers than to the design of the body equipment.

The standardized type of field ambulance adopted by the French armies is a 15-hp. Fiat carrying five stretcher cases, or eight sitters. The motor is a four-cylinder block type, 3.14 by 5.5 in., 171 cu. in. piston displacement. It has shaft drive, with four speeds ahead, and is equipped with steel disk wheels carrying pneumatic tires 32 x 4½, the rear being twins. There are two spare wheels for each ambulance.

It is not suggested that this is the only suitable chassis, although it is the one most largely used. Experience has shown, however, that this type of chassis is the smallest which can be relied on for all-around work, and that with a suitable type of body it will carry the biggest loads feasible under road conditions at the front.

At the beginning of the war it was considered that a load of four stretcher cases was the maximum with any ordinary ambulance. Sitting cases never presented much complexity, and it did not matter greatly whether the ambulance carried eight, ten, eleven or twelve patients. In many cases, however, while accommodation could be provided without much difficulty for eleven sitters inside, there was no room for more than four stretchers. The Italians endeavored to solve the stretcher problem by adopting a more powerful chassis, the motor being 3.9 by 5.5 in., and fitting a very high body which would receive six stretchers in two vertical rows of three each. The disadvantages of this were a very high body which would not always pass easily under low bridges, gateways and other obstructions; also a top-heavy vehicle which swayed violently when driven at any speed on shell destroyed roads.

OF particular interest to the United States Army at the present moment, due to its lack of an adequate motorized ambulance system, is this article relative to the standard type of motor ambulance which has proved very satisfactory in the French Army. The article, secured by W. F. Bradley, THE COMMERCIAL VEHICLE'S *special correspondent with the Allied armies in France, was obtained by permission from, and through the co-operation of, the French military authorities, and as such has the stamp of approval which demands attention.*

The French have succeeded, in their standardized type, in providing accommodation for five stretchers with a smaller vehicle than that used by the Italians, also with the use of a motor having 92 cu. in. less piston displacement, this latter point being of great importance from the economical standpoint, where thousands of vehicles are used.

It has only been possible to get down to a motor of this size when the entire vehicle has been correctly designed and close attention given to total weight, rear overhang, and gear ratio. The writer, for instance, has been on front dressing-station work with this same chassis equipped with a very handsome and comfortable four-stretcher ambulance body, but because of great dead weight and incorrect gear ratio, the vehicle was a very indifferent success and would have been a failure if given out indiscriminately to army drivers.

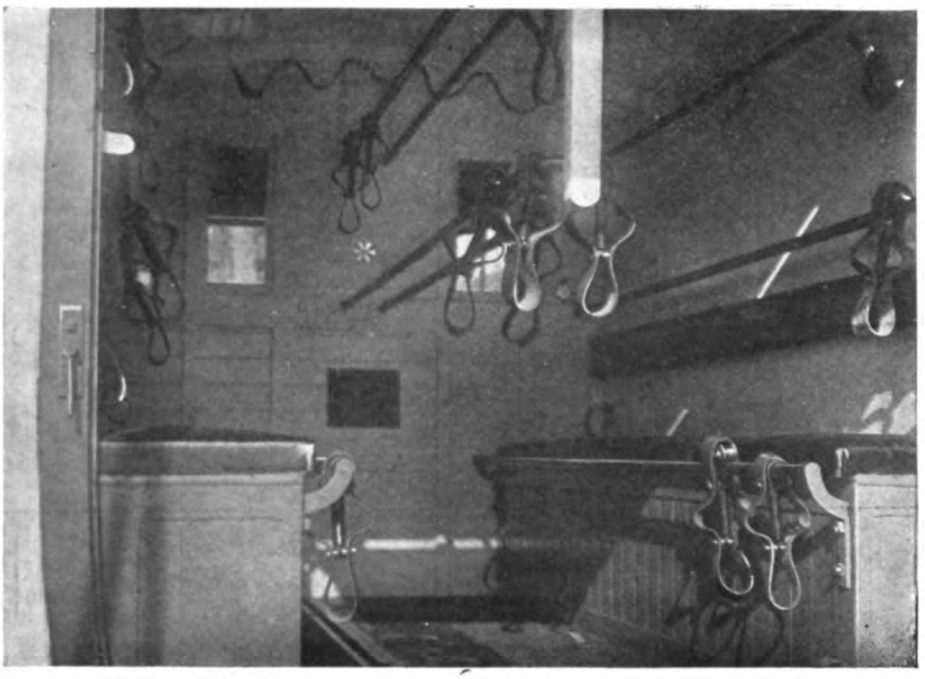
The all-wood body has proved the most suitable for field service. On the Italian front a certain number of Buicks and

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G. M. C.'s are employed with a wood frame canvas covered, there being an outer and an inner layer of canvas, and a canvas roll cover at the rear. Merely from the weight standpoint. these are very advantageous. Canvas, however, is not sufficiently durable for work at the front. Under rough and crowded road conditions the canvas sides were constantly being torn by the overhanging branches of trees, or by the overhanging loads of other vehicles. Further, painted canvas is difficult to keep clean. In summer time the only method of giving air was to leave the rear flap rolled up. An all-wood body with sheet metal outside proved durable, and always presented a smart appearance, but this construction made a body too heavy for the size of motor now arrived at.

French Standardized Body

In the French standardized body there is only one thickness of planking, dovetailed so as to give a smooth inside surface. All the interior is painted and varnished white. With a view to cleanliness the smoothest possible interior is important. Trench mud is the least objectionable kind of dirt to be cleaned out of ambulances working at front line dressing stations. As will be seen from the illustrations, there are two seats placed longitudinally in the vehicle; each carries an imitation leather cushion, and has a back rest of the same material. These seats, which will comfortably carry four men astride, although five can be accommodated at a pinch, are completely boxed in. This arrangement allows four big-capacity lockers to be built under the seats, one at each corner of the body, with entrance to them from the outside. This is a very practical arrangement, for it gives the driver two lockers for tools, jack, spare oil, etc., and two lockers for his own kit. As, under front line conditions, the driver may have to practically live on his ambulance, some provision must be made for his kit. It has been found, too, that if space is left under the seats it is very rarely used by wounded men for carrying their kits, and this space also adds to the difficulty of keeping the car clean. This arrangement therefore gives locker space which otherwise would not be used. The center portion of the space under the seats is occupied by the rear wheels, for the body is the full width of the chassis and is undercut to make room for the wheels.



This shows how the French ambulance is made comfortable for loading and unloading. Note the spring loops for the front end of each stretcher pole and how these loops are carried on rolls so that the stretcher may be pushed in without a man inside the body. This eliminates the jars and jolts that are very painful to the seriously injured man

Interior of Body

The body is divided down the center by two pairs of steel tube rails attached to the front body panel and at the rear to a vertical bar hung from the roof. There are two similar rails on each of the sides of the car and one in front of each seat, going under the men's knees when sitting cases are carried. On each of these rails is mounted a grooved pulley and an endless girth with a coil spring attachment, also a second girth, also spring mounted, but without a pulley. The forward arms of the stretcher are passed into the pair of pulley mounted girths, the stretcher is pushed ahead, and the other two girths slipped over the rear arms of the stretcher. Two of the stretchers are very close to the roof; two others are just below, the bottom of the stretchers only just clearing the seats; and the fifth stretcher is exactly in the center, between the two seats.

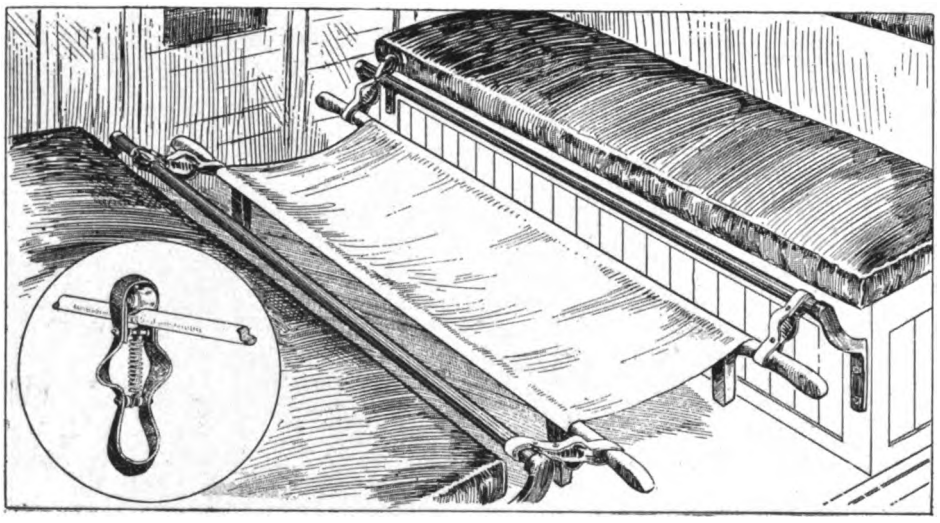
This arrangement not only saves time in loading, but it avoids jars to the patients. On many of the earlier ambu-





Contrast the Ford ambulance on the left with the French type at the top of this page. The serious faults of the Ford type are that the stretchers are not spring mounted; it is difficult to load; a large rear overhang, which makes for uneasy riding; the swinging oil lantern is dangerous and the canvas sides tear easily, wear out quickly and offer hiding places for vermin. The other American type at the right has many of the same disadvantages

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Detail of the spring mounted loop for the front end of each stretcher side rod and a perspective view of the manner in which the stretcher is hung. It has been found unnecessary to have a center aisle, and this space is utilized for the fifth stretcher carried in the vehicle

lances the seats were folding and on being opened out each presented a pair of hollow rails to receive the stretcher legs. Two metal frames, hinged to the walls, could be lowered to provide two more pairs of rails. There is always a tendency for the stretcher legs to wedge in these rails, and to avoid jerky movements one man must be inside to ease the stretcher along. This necessitates a minimum of three men—one for the front end of the stretcher and two for the rear. With the new French type it is not necessary for any man to be inside; when the forward stretcher arms have been slipped into the girths, the entire stretcher can be pushed ahead with perfect ease. These loading arrangements are very important, for in badly designed ambulances wounded men are often hurt more by being lifted into and taken out of an ambulance than by the actual journey. Wounded men often view an ambulance journey with fear; their fears are more likely to be justified in the loading than in the actual journey.

Central Passageway Unnecessary

One of the old-time rules of ambulance design was that there should be a central passageway between the two rows of stretchers and a seat at the head of the ambulance for an attendant. In practice no attendant is ever carried inside an army ambulance. The writer assisted in the transportation of several thousand wounded on the European front, and except in a few rare cases where high staff officers were the victims, the wounded were transported without an attendant. Other exceptions were a few cases of men who went raving mad under shell fire. But these exceptions do not call for any modification of the design.

In this standardized type of ambulance the lowest pair of rails are much further apart than the width of the stretcher. This is no disadvantage, for the girths can assume any angle, and need not necessarily hang vertically. In certain cases wounded men are placed on a mattress obtained from some wrecked house, and it is considered advisable to keep them on this mattress until they reach the hospital. The extra width between the two lower rails allows this to be done; the mattress, being wider than the stretcher, obviously could not be carried on the upper rails.

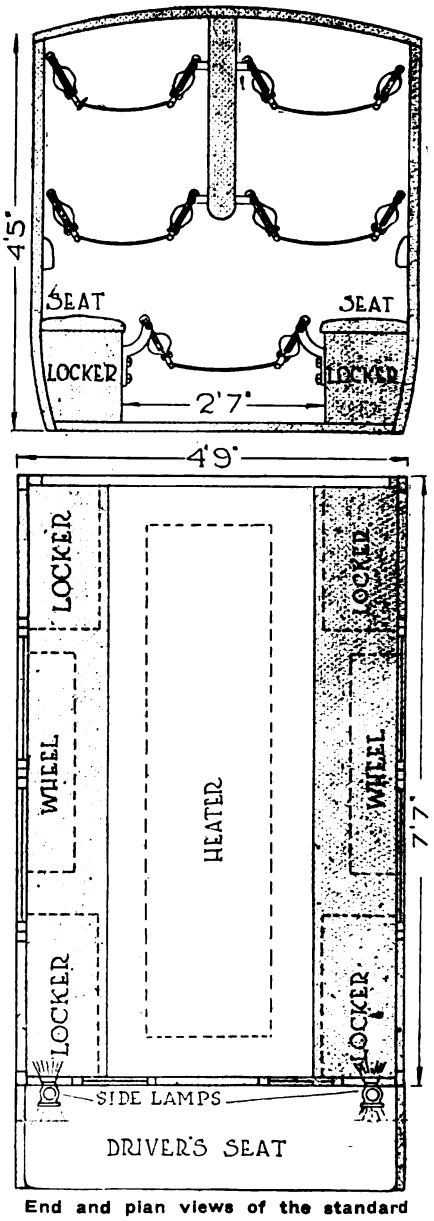
The rear door is in two parts, hinged top and bottom. This arrangement is preferable to doors hinged in the ordinary way, for the latter are apt to fly open when traveling, with ill results to all concerned. Canvas doors are not at all satisfactory. For summer use fresh air can be given by opening the two center upper panels on each side of the body, each of these panels hinging back and folding against the end panels. There are two glass windows at the front, immediately behind the driver and the mechanic. Windows are least liable to breakage in this position; they are also necessary in order to enable the driver to ascertain what is happening inside.

It has been found essential, on most portions of the front, to heat ambulances when on winter service. This has been done on the standardized French type by fitting a metal box about 8 inches wide, flush with the floor. The box extends the full length of the body, the exhaust gases can be turned directly into this box and are evacuated at the rear. With a completely closed all-wood body the degree of heat obtained is quite sufficient for all conditions. It is most essential, however, that this heater be well made; cases have occurred where, owing to defective workmanship, the exhaust gases have leaked into the ambulance and asphyxiated the patients.

Driver's Equipment Satisfactory

From the driver's standpoint the equipment is simple but satisfactory. There is a fixed canvas top above the driver's seat, supported at the front by steel uprights bolted to the dash at their base. Apart from the question of solidity these uprights are useful as a protection for the driver when wires have been hung across the road. There are waterproof curtains which when not in use roll on the top and sides of the dashboard and also in the top; they enable a practically closed cab to be obtained in bad weather. There is a short wood runningboard at each side. Two spare disk wheels are mounted, above the right runningboard; on the left runningboard is the acetylene generator supplying gas to two headlights mounted in the usual position and also a box to receive two spare cans of gasoline. The gasoline tank is under the seat, but is not sufficiently high to give gravity flow on hills. Pressure is maintained from the exhaust with the addition of a hand pump on the dash. This is the only fea-

(*Continued on page* 28)



End and plan views of the standard French army ambulance, showing how the stretchers are carried and the position of the lockers with doors opening from the outside. Note also how the side lights are utilized to serve the double purpose, showing the width of the vehicle at night and illuminating the interior

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Our London Letter

(*Continued from page* 17)

India, as an Indian correspondent informs me, caused very great inconvenience to merchants and others in that country. American chassis were being imported in some numbers, and I am told were standing up very well under the difficult conditions, but the shortage of freight and the necessity of limiting all imports at the present time appear to have influenced the government in placing an embargo on this class of machinery.

Possibilities in India

There is no doubt that with an improvement in the road system of the country, India will prove a good market in the future for those who get in with an attractive proposition. The cotton mills of Bombay, like those of Lancashire, will be sure to find that motor transport is a great factor in the development of an industry. I am told also that there will be, after the war, a very great development in the volume of commercial vehicles for passenger transport. Everyone, including the natives, is averse to walking any distance so that a system of public conveyance is always certain of support. At present the things that prevent a greater development are the regulations, which differ in each district. For example, a public service motor may carry twenty persons in one district, but the moment that it crosses the boundary into another district it is quite possible that the regulations prevailing there will only allow ten persons to be carried. Presumably the others would have to get off the vehicle and finish the journey on foot, a state of affairs that can scarcely be described as satisfactory.

The Indian government has for some years been paying close attention to the subject of motor transport, and since the war began has done a great deal to organize efficient transport by motor vehicles, particularly in connection with military work. In this work it has had a considerable amount of expert assistance from England.

Electric Industrials Increasing

The electric vehicles movement continues to make satisfactory progress mainly on account of the difficulty of getting adequate supplies of gasoline. In most districts the price of electric current has been advanced generally from 2 cents per unit to 3 cents, which still enables the electric to compete satisfactorily with other forms of traction. So far as the larger types of trucks are concerned the principal buyers have been municipalities and other public bodies. The Electric Vehicles Committee has arranged a very comprehensive list of places where charging facilities are now available for electric trucks throughout the country, and I have no doubt but that this will assist the movement very materially.

It is worth noting that the various electric vehicles firms are doing quite an extensive business in small platform or warehouse trucks. Big truck firms like the Daimler Co., of Coventry, and The Associated Equipment Co., Walthamston, builders of the London General Co.'s B type buses, are using those made by the General Vehicle Co., while many works and munitions factories are using Buda electrics, which are marketed by the Electromobile Co., Ltd., of Leeds, a firm that has been associated with electric vehicles for many years. Of course, the principal railway companies are using these small battery-driven trucks for moving merchandise and passengers' baggage at the various freight terminals, and their use is likely to extend very greatly in the future.

Future Overseas Trade Uncertain

Motor trade politics in the British Isles are in too unsettled a condition to say what steps will be taken by manufacturing and selling houses to regain their share of overseas trade. Of course many possibilities have been discussed, but without any definite action being taken. No doubt if we could see an early end to the present hostilities this would stimulate the manufacturers into coming to some agreement as to their future policy, and would also have the effect of allowing such schemes as are being considered tentatively to take definite shape.

As I have already told you, a great deal of faith was, for some time, placed in the efficacy of a protective tariff, but I am inclined to think that that idea is beginning to recede into the background. I do not say that it will be abandoned, but manufacturers, or at all events those of them who are tariff reformers, are beginning to realize that the protection of the home market would not make very much difference in any competition that may be encountered in other countries or even in the British overseas colonies.

I think I cannot do better than quote H. C. B. Underdown, chairman of the Commercial Vehicle Section of the Association of British Motor Manufacturers, in this connection. Mr. Underdown, who is managing director of Commercial Cars, Ltd., of Lutton, makers of Commer cars, writing in the current issue of the *Times Trade Supplement* says: "It remains to be seen whether a real protective tariff for a certain number of years after the war will be adopted or not. The adoption of a temporary high tariff during the period of reconstruction as an emergency measure would not necessarily imply a departure from Free Trade principles. But assuming that a tariff is created to help the motor industry, it is, in the writer's opinion, essential that the industry itself should take to heart the lessons of the past, lessons which the war has clearly shown can no longer be ignored."

What these lessons are Mr. Underdown goes on to tell his readers, and he instances the United States as showing us the value of a large output of standardized manufactures. He considers that the States have shown us the value of combination with its reduction in cost, in production and distribution.

"If the motor industry," he writes, "is to profit by the lessons of the war and emerge successfully from the intense competition which will ensue on the coming of peace, it must set to work to introduce methods altogether fresh to the minds of many engaged in it. Too much reliance must not be placed on government assistance, vital though this will be. The war has shown us that *laisser-faire* must give way to hustle. Competition between firm and firm in the same line of business must give way to co-operation, specialization and organization of the highest order."



One of the Fords which rendered such excellent service on the Mexican border in carrying rifle and machine gun ammunition turned to recruiting purposes in New York City by the Sixty-ninth New York Infantry. The Lewis machine gun, the light American type which has been adopted by the British Army, is shown mounted on the dash to draw attention. It is not so mounted under actual war conditions. Quite a fleet of these Fords made a whirlwind tour of the Metropolis and secured a large number of recruits

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Better Truck Maintenance and Repair

Two Pages Each Issue on the Best Repair Ideas for Owners

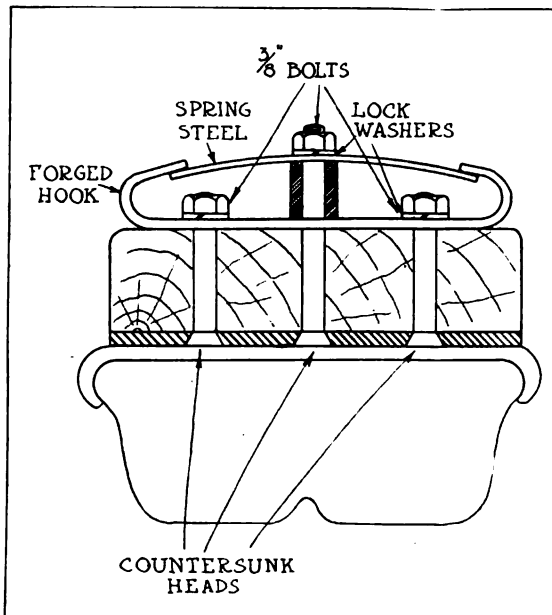
Write us a letter telling how you maintain your trucks efficiently or of some good motor truck repairs you have made

A minimum of $1 each will be paid for accepted ideas on better truck maintenance and repair suitable for these pages. Simply send in a rough pencil sketch bringing out your idea and as few words as possible in order to explain it

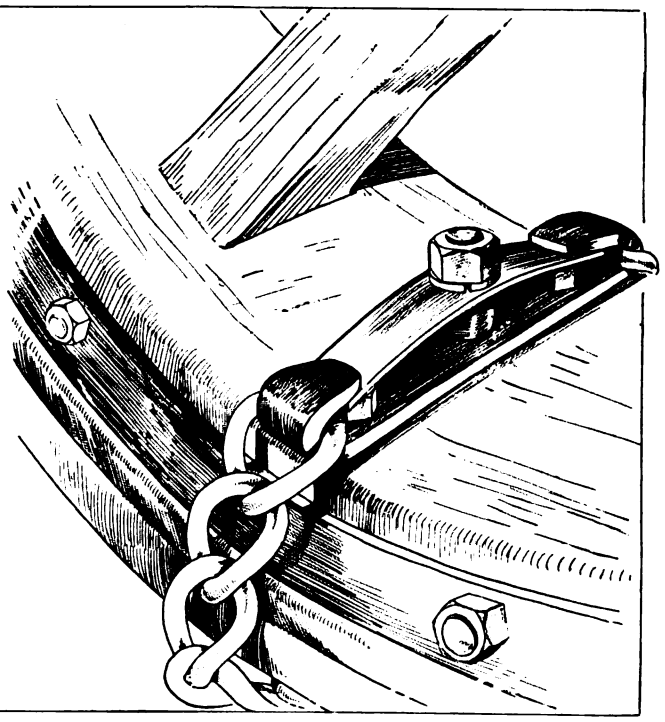
Pratt Gives Simple Chain Attachment Device

THE home-made non-skid truck chain attachment device shown below has stood a 3 years' test successfully. It was designed and thought out by Theodore D. Pratt, recently works engineer in charge of the fleet of gasoline and electric trucks owned by the Central Stamping Co., Newark, N. J., and now executive secretary of the Motor Truck Club of America.

Pratt's cross-sectional sketch shows very clearly the simple manner in which the device is made.



Pratt's sketch of his home-made device for attaching non-skid truck chains



The artist of THE COMMERCIAL VEHICLE *made this drawing from Pratt's sketch to show how the device looks in place*

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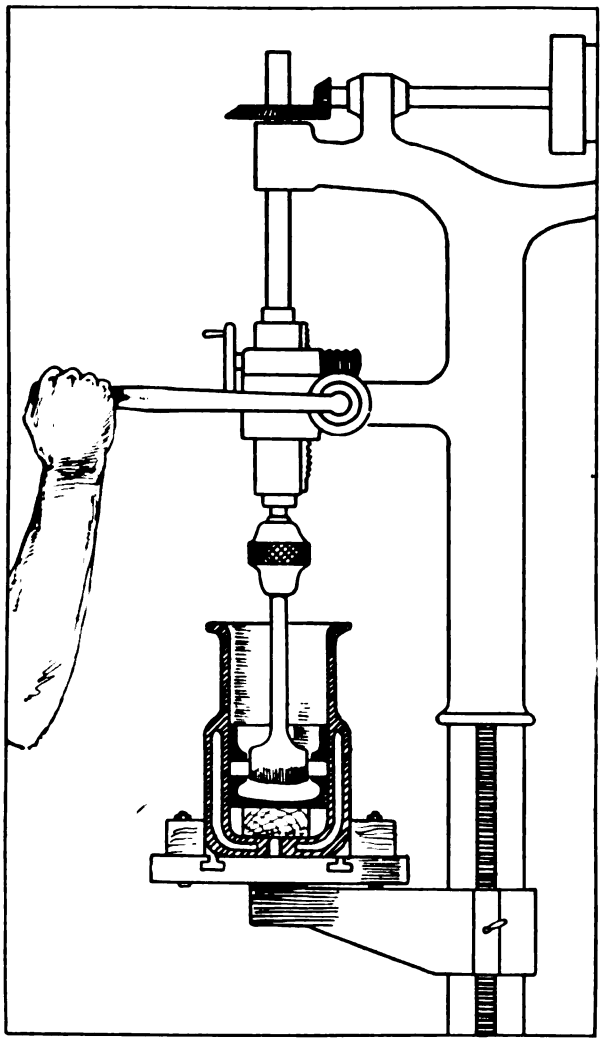
It consists of a bar of ⅜ by 2 iron turned up at each end as shown. This is bolted to the inside of the wheel felloe between every other set of two adjacent spokes, or in other words, with two spokes between each bar. The open end of the bar is closed by means of a piece of spring steel held in contact with the ends of the bar by means of a pipe spacer around a bolt through the felloe as indicated.

Several pieces of ordinary non-skid chain are carried in the toolbox of the truck and when they need to be applied to the wheels are simply slipped over the ends of the bent bars and the spring clips allowed to spring back into place, thereby holding each chain in place. Each chain is a unit by itself, one end being slipped in place, the chain carried over the tire tread and the other end locked in a similar manner.

The real feature of the device is not so much the use of the spring for locking the chain in place as is the method by which it is fastened to the wheel. Set screws with lock-washers are not sufficiently strong to withstand the strains set up, so two bolts with counter-sunk heads are used and carried clear through the metal band around the wood felloe. The hole in the band is countersunk to fit the head of the bolt. A nut and lock washer is used on the inside, the latter preventing the nut from working loose due to the vibration while the truck is in motion. Similarly, the bolt holding the spring catch extends clear through the wood felloe and metal band and is held in place by a nut and lock washer.

Spare lengths of chains are always carried in the truck's toolbox, so that a broken chain can be replaced at a moment's notice, the broken link being repaired after the truck has returned to the garage.

The type of chain-holding device shown herewith is used on all of the six large gasoline and electric trucks of the Central Stamping Co.'s fleet and has given complete satisfaction.



A simple method of lapping in a scored cylinder by using an old piston and a drill press to give a combined up-and-down and circular motion

An Easy Way of Lapping In Scored Cylinders

THE sketch to the left shows a simple method in which machine power may be used to lap in a scored motor truck engine cylinder, provided the grooves cut in the walls are not too deep. An old piston with a dummy connecting rod having the usual piston end boss, but a straight crank end so that it can be inserted in the chuck of a drill press, is utilized for the job.

After the cylinder block has been set up on the drill press table and held in place by means of suitable clamps, the piston is inserted in the cylinder to be lapped in, the drill press chuck slipped over the blank end of the connecting rod and connected with the drill press. Then by putting the press back gears in, the drill chuck is revolved slowly, turning the piston within the cylinder. At the same time, the drill chuck is moved up and down by means of the hand lever so that the piston has a combined up-and-down and circular motion.

The piston is coated with a compound formed by mixing fine emery and oil. This substance and the combined up-and-down and circular motion will give a fairly accurate finish in the cylinder bore, provided the scorings were not too deep or in cases where the cylinder casting has warped slightly so that the rings do not bear equally at all parts of the bore.

As a matter of precaution to prevent the piston from striking the bottom of the cylinder head, a small wooden block is inserted as a stop piece as shown in the accompanying sketch.

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The Readers' Forum

Devoted to topics pertinent to commercial vehicle operation, design and maintenance. Open to the use of all readers. Communications must be accompanied by the sender's name and address, confidential if preferred. No charge is ever made for this service.

MAKERS OF ELECTRIC TRUCKS

Nine Concerns Now Manufacturing Electrics in This Country

To the Editor, COMMERCIAL VEHICLE:

Will you please furnish me with a list of the manufacturers of electric motor trucks and give me the address of the maker of the Dey electric passenger car, which, I understand, is partially designed by the eminent electrical engineer, Dr. Charles P. Steinmetz.—J. B., Borge Incinerator Corp., New York City.

You will find below the names and addresses of concerns now manufacturing electric motor trucks:

Atlantic—Atlantic Vehicle Co., Newark, N. J.
Couple-Gear—Couple-Gear Freight Wheel Co., Grand Rapids, Mich.
C. T.—Commercial Truck Co., Philadelphia, Pa.
G. V.—General Vehicle Co., Long Island City, N. Y.
Lansden—Lansden Co., Brooklyn, N. Y.
Old Hickory—Kentucky Wagon Mfg. Co., Louisville, Ky.
Urban—Kentucky Wagon Mfg. Co., Louisville, Ky.
Walker—Walker Vehicle Co., Chicago, Ill.
Ward—Ward Motor Vehicle Co., Mt. Vernon, N. Y.

The Dey electric is manufactured by the Dey Electric Corp., with offices at 45 Broadway, New York City. As we understand it, Charles P. Steinmetz did not design the Dey electric, but simply acted in an advisory capacity to the Dey corporation's engineers.

DUMPING TRAILERS FOR BRICKS

Brick Maker Wants Dumping Trailer to Increase Capacity

To the Editor, COMMERCIAL VEHICLE:

Will you please advise if any concern manufactures a trailer which could be used in place of the body on a 5-ton truck to increase its carrying capacity and which would enable it to deliver and dump ordinary bricks?—F. A. BROWER, Brower & Best, Thompsonville, Conn.

To the best knowledge of THE COMMERCIAL VEHICLE, the type of equipment which would best suit your requirements is that used by the Standard Building Supply Co., Inc., foot of Twenty-fifth Street, Brooklyn, N. Y. This consists of a Garford tractor, made by the Garford Motor Truck Co. of Lima, Ohio, and a Shadbolt semi-trailer, made by the Shadbolt Mfg. Co., Brooklyn, N. Y. Of course there may be other similar and just as efficient outfits at work in other parts of the country.

The trailer, of the two-wheeled type, is supported on a fifth wheel mounted on the tractor frame, and is provided with a chain-operating mechanism so that its body may be lifted to unload all the bricks at one time. The body is sufficiently large to carry 5000 bricks. The power for unloading the body is secured from the tractor engine.

Almost any motor truck can be used as a tractor of this nature, and semi-trailers for use in connection with the tractor for hauling bricks can be secured from any wagon builder or from one of several concerns which specialize in such equipment. Among the latter are:

Chicago Pneumatic Tool Co., Chicago.
Los Angeles Trailer Co., Los Angeles.
Martin Rocking Fifth Wheel Co., Springfield, Mass.
Shadbolt Mfg. Co., Brooklyn, N. Y.
Variety Mfg. Co., Chicago, Ill.
Watson Wagon Co., Canastota, N. Y.
J. C. Wilson Co., Detroit.

The elevation of the trailer body may be accomplished by a hand hoist and gear, chain hoist or a hydraulic mechanism. Hoists such as would be suitable for your use are manufactured by the following companies:

Hydraulic Hoist Mfg. Co., St. Paul, Minn.
Littleford Bros., Cincinnati, Ohio.
Meisel Press Mfg. Co., Boston, Mass.
Wood Hydraulic Hoist & Body Co., Detroit.
C. J. Young Co., Seattle, Wash.

One such tractor and two-wheeled semi-trailer device in which the body was elevated by means of a hydraulic hoist was shown at the Boston Truck Show of 1916 and described in the March 15, 1916, issue of THE COMMERCIAL VEHICLE, page 7. This equipment was owned by the city of Providence, R. I., Department of Public Works, and was made up of a Knox tractor and a large semi-trailer.

MAKERS OF TRAILERS FOR HEAVY SERVICE

Two- and Four-Wheeled Types for Use Behind Tractors or Trucks

To the Editor, COMMERCIAL VEHICLE:

Will you please give us the names and addresses of several responsible concerns which manufacture four-wheeled and two-wheeled trailers for heavy service?—A. A. BONSACK, Bonsack Machine Co., St. Louis, Mo.

Among the makers of two- and four-wheeled types of trailers for heavy service are the following:

Four-wheeled type

Arcadia Trailer Corp., Newark, N. Y.
Columbia Motor Truck & Trailer Co., Pontiac, Mich.
Detroit Trailer Co., Detroit, Mich.
Glen Wagon & Car Corp., Cortland, N. Y.
Troy Wagon Works Co., Troy, Ohio.
Watson Wagon Co., Canastota, N. Y.

Semi-trailers can be made by any wagon maker or can be provided by concerns which specialize in such equipment. Among the latter are:

Chicago Pneumatic Tool Co., Chicago, Ill.
Fruehauf Trailer Co., Detroit, Mich.
Glen Wagon & Car Corp., Cortland, N. Y.
Los Angeles Trailer Co., Los Angeles, Cal.
Martin Rocking Fifth Wheel Co., Springfield, Mass.
Jacob Press' Sons, Chicago, Ill.
Shadbolt Mfg. Co., Chicago, Ill.
Variety Mfg. Co., Chicago, Ill.
Watson Wagon Co., Canastota, N. Y.
J. C. Wilson Co., Detroit, Mich.

MANUFACTURERS OF LIGHT THREE-WHEELERS

Truck User Desires Data on Light Three-Wheeled Tractors

To the Editor, COMMERCIAL VEHICLE:

Will you kindly furnish us with the names and addresses of any concerns manufacturing light three-wheeled gasoline road tractors?—W. E. MAXSON, Superintendent Winchester Repeating Arms Co., New Haven, Conn.

As far as THE COMMERCIAL VEHICLE knows, there is no concern now actually engaged in the manufacture of light three-wheeled road tractors. For that matter, there are no heavy three-wheeled road tractors now being manufactured in this country, the last such vehicle manufactured being the Knox three-wheeler, which was discontinued during the latter part of 1909 and the beginning of 1910, when it was replaced by a new model with four wheels.

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CO-OPERATIVE DELIVERY DATA

Canadian Merchants' Assn. Seeks Form of Contract Employed

To the Editor, COMMERCIAL VEHICLE:

We wish to obtain some information in connection with co-operative deliveries for retail merchants in cities of 20,000 and upward.

We understand that you very thoroughly covered the situation in one of your recent issues. We shall, therefore, be glad if you will let us have any data you may possess covering information you have gained in this connection.

One of the problems that we are particularly anxious to receive information upon is as to how traffic is being best handled, that is to say, whether it is better to establish a central depot for the sorting of parcels which have been gathered from the various stores and redistribute therefrom, or deliver same straight from store to customer. Possibly you may be in position to advise us of some points where co-operative delivery systems for retail merchants are working satisfactorily, that we may write direct for further information. One of the first things we are anxious to obtain is a copy of the contract which is being used between merchant and delivery companies or associations.—F. E. RAYMOND, Retail Merchants' Assn. of Canada, Saskatoon, Sask.

The article to which you probably refer is that concerning the Clearing House Parcel Delivery Co., Boston, Mass., which appeared in THE COMMERCIAL VEHICLE of Dec. 1, 1916, under the heading, "Achievement of Success in Parcel Work Due to Co-ordinated Efficiency."

We do not have on file a copy of the contract used between that company and the merchants for whom it delivers, but you no doubt can obtain one by writing the Clearing House Parcel Delivery Co. direct at Boston, Mass.

There are few such systems in use, due to the fact that many companies formed and operated for the work of delivering the packages of several department stores, etc., have failed because their trucks were not maintained properly or because the profits obtained through efficient truck operation were eaten up by poor internal-handling methods. Men who seek success in the formation of such a company must not only be experts on truck operation, but also experts in department store package-handling systems.

There was formerly a Merchants' Parcel Service Co. in Chicago, but this failed. A similar service concern was started some time ago in Springfield, Ill., but its present status is not known.

It is understood that a successful parcel delivery service is now in operation in Scranton, Pa.

A somewhat modified form of co-operative delivery is used in New York by James McCreery & Co. and Lord & Taylor, both large department stores having a common delivery service performed by the Eleto Co.

The Clearing House Parcel Delivery Co. employs its own central depot, to which its trucks bring all the packages collected from the company's 150 customers. Particular trucks are used for this work and deliver their load onto the moving belt at the central depot, from which the packages are sorted into various route bins very similar in design and layout to those used in large department stores. The plant layout was fully described and illustrated in the Dec. 1 issue of THE COMMERCIAL VEHICLE.

Where there is a large number of packages to be delivered, it is considered better practice to make use of the central station, where all the packages can be sorted. The reason for this is that the trucks are thus likely to have larger and nearer full capacity loads on each route than would be the case if the packages were picked up at the various stores and the trucks carrying them run on no definite routes.

COST OF ELECTRIC 5-TONNERS

Operating Costs of Electrics of 2- and 5-Ton Capacities

To the Editor, COMMERCIAL VEHICLE:

Will you please give me what figures you may have regarding the cost of operation of 2- and 5-ton electric trucks? —ALTON BENNETT, George B. Wuestefeld, New Haven, Conn.

According to a table of costs prepared by William P. Kennedy for the Electric Vehicle Assn. from data secured throughout the United States and presented in a paper read before the National Electric Light Assn. convention, held in San Francisco in June, 1915, the costs of operation of 2- and 5-ton electric trucks are as follows:

2-Ton Electric			
Price (with average body)	$3,400		
Interest at 6%	$204		
Depreciation at 10%	340		
Fire insurance at 1%	34		
Liability insurance	100		
		$678	
Maintenance—			
Battery upkeep	$285		
Tire upkeep	306		
Machine parts upkeep	100		
		691	
Garaging—			
Electric power	$300		
Storage and washing	180		
Garage labor	200		
		680	
			$2,049
Annual operating cost—			
Daily cost (312 days)	$6.57		
Drivers per day	2.50		
Total daily cost	$9.07		
5-Ton Electric			
Price (with average body)	$4,500		
Interest at 6%	$270		
Depreciation at 10%	450		
Fire insurance at 1%	45		
Liability insurance	100		
		$865	
Maintenance—			
Battery upkeep	$415		
Tire upkeep	575		
Machine parts upkeep	150		
		1,140	
Garaging—			
Electric power	$400		
Storage and washing	180		
Garage labor	300		
		880	
			$2,885
Annual operating cost—			
Daily cost (312 days)	$9.25		
Drivers per day	3.00		
Total daily cost	$12.25		

TORQUE ARMS ON MOTOR TRUCKS

Why Some Trucks Use Torque Arms and Others Utilize Springs

To the Editor, COMMERCIAL VEHICLE:

Will you please tell me what the idea is of using torque arms on motor trucks and whether or not this method is much superior to the other system in which the torque is taken through the rear springs?—I. E. Co., INC., New York City.

The reason for the use of torque arms on motor trucks is to prevent the tendency of a live axle to twist under driving stresses. At first, practically all types of trucks with live axles employed torque arms, but the great increase in the development of high-grade truck springs has resulted in many truck concerns dropping torque arms and taking the driving and torsional stresses through the springs. This practice, of course, eliminates torque arms and thereby simplifies the chassis and reduces its weight by the weight of the arms.

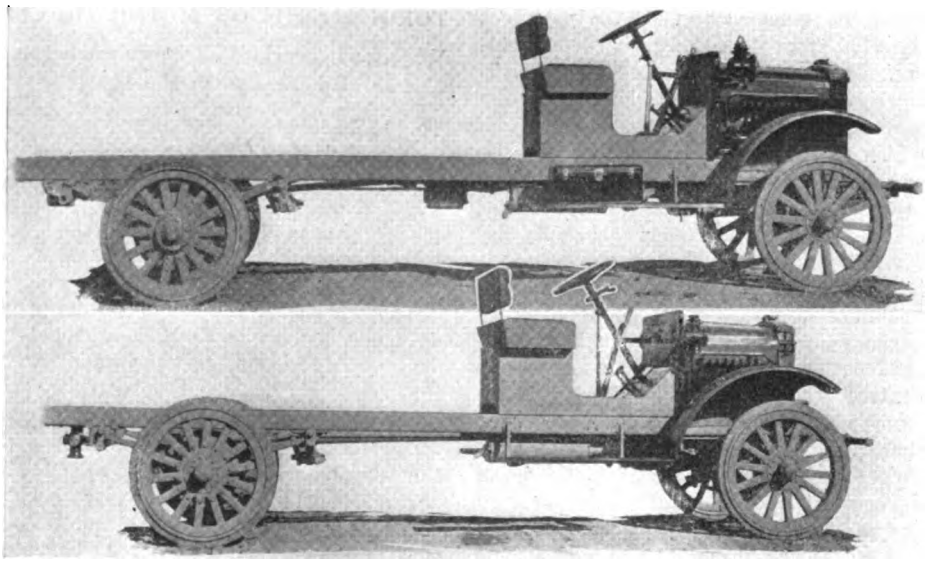
This method makes it necessary that the springs, which must be of the very best material and workmanship, be anchored to the axle with extra rigidity and shackled to the frame at one point only.

The Hotchkiss drive, which is the common expression for the method employed to take both the driving and propulsive stresses through the springs, has increased steadily in the past few years and is now in the majority. While there are several 5-ton and 6-ton trucks employing this method, its use is confined to trucks of medium capacity in the majority of cases. This is because the thrust or propulsive duty on the springs assumes such great proportions in a heavy truck that nothing but the best type of spring with an especially large and rugged pinning at the driving end can give satisfaction.

Of the 386 gasoline and gasoline-electric motor truck chassis offered on the American market for 1917, as stated in the specification issue of THE COMMERCIAL VEHICLE, published Nov. 1, 1916, 82¾ per cent of all the models used springs to take the torque, whereas 11⅜ per cent used torque arms. In a similar issue published for the trucks of the year 1916, 81 per cent of the models offered used springs to take the torque and 9¾ per cent employed torque arms.

It should be understood that these averages refer to the number of different models offered on the market in 1916 and 1917 respectively, and not to the number of trucks actually manufactured in either of those years. The models-offered plan of estimating percentages is perhaps the most accurate, since the total production figures are at the best an estimate because of the unwillingness of some makers to make their output public.

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Two of the six Service models, the 2-tonner at the top and the 1-ton unit below. Note the clean lines and the new design of hood and radiator

Service Line of Six Models Improved and Increased in Price

SERVICE SPECIFICATIONS

Capacity, tons	1	1½	2	3½	3½S	5
Price	$1,500	$2,200	$2,500	$3,300	$3,600	$4,300
Wheelbase, in.	137	150	160	171	171	171
Tires, front	34x3	36x3½	36x4	36x5	36x5	36x6
Tires, rear	34x4	36x5	36x7	36x5d	36x5d	36x6d
Bore, in.	3½	4	4¼	4¼	4½	4½
Stroke, in.	5⅛	5½	5½	5½	6	6
N. A. C. C. hp.	19.60	25.60	29.00	29.00	32.40	32.40
Speed, r.p.m.	1,370	1,100	1,100	1,100	1,000	1,000
Speed, m.p.h.	18	15	15	12	14	10
Gear ratio in high gear	7.75-1	7.75-1	7.75-1	8.75-1	7.8-1	10.25-1
Final drive	Worm	Worm	Worm	Worm	Worm	Worm

SERVICE trucks, increased in price between 7½ and 18 per cent, and changed slightly in design and construction, are offered in six models ranging from 1 to 5 tons capacity, as previously given in the specifications published in THE COMMERCIAL VEHICLE of Nov. 1, 1916.

The general changes in design include the adoption of the Simplex governor, the Master carbureter in place of the Stromberg on all models except the 1-tonner; the adoption of the Eisemann automatic-spark-advance magneto on the Special 3½-ton model and the 5-ton unit. Fore and aft steering gears of Ross manufacture have been adopted on all six models. Other minor improvements have been made in the clutch and control set, the mounting of the hood and in the spring suspension on the 1½- and 2-ton models.

Along with these changes as given, slightly increased prices which range from between 7½ and 18 per cent were effected. The old and new prices, the difference in price and the per cent of increase are shown in the following table:

Capacity	Old Price	New Price	Increase	Per Cent Increase
1	$1,375	$1,500	$125	9
1½	1,950	2,300	350	18
2	2,250	2,500	250	11
3½	3,000	3,300	300	10
3½S	3,250	3,600	350	10
5	4,000	4,300	300	7½

All the Service models are worm-driven and follow the same general line of design in which standard parts are used such as Buda engines, Long radiators, Fuller, and Borg & Beck clutches, Fuller, and Brown-Lipe gearsets, Timken axles, Sheldon and Kalamazoo springs, Bimel wheels and Ross steering gears.

The line consists of 1-, 1½-, 2-, 5-ton models and two units of 3½-ton capacity. All models are characterized by the use of the cast-iron case radiators with finned-tube-vertical cores placed in front of the conventional European type hoods; single ignition with high-tension magnetos; two-unit starting and lighting electrical systems on option; gravity feed on all models except the 1-tonner, which has the vacuum system, and dry-plate clutches on all models except the 1-tonner, which has a multiple-disk unit; selective gearsets with three speeds on the smaller models and four speeds on the two 3½-tonners and the 5-ton model. Hotchkiss drive is similarly employed on the three smaller models with radius rods on the three larger.

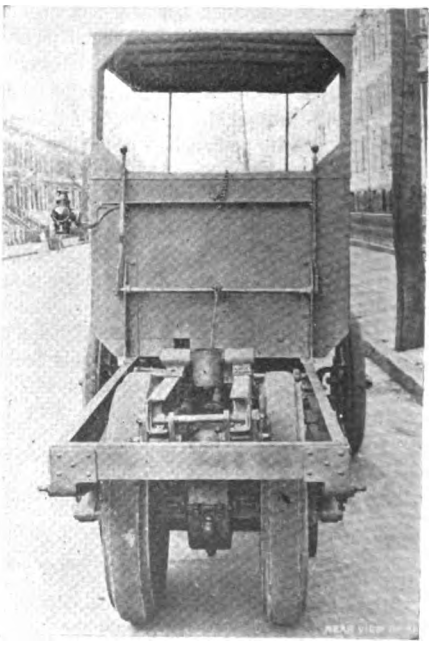
The different changes made in each model of the new line as compared with those for which specifications were given in the Nov. 1, 1916, issue of THE COMMERCIAL VEHICLE are as follows:

The 1-tonner has a radiator mounted in a cast case instead of the former sheet-metal housing and the hood has been given a new slope away from the dash and down toward the radiator, giving a better front line. The method of securing the hood has been improved by bringing its side members down outside of the filler strip instead of inside. Gearshift and hand-brake levers have been made longer and slightly heavier to facilitate the control. Last year's Bosch magneto has been replaced by an Eisemann. The Timken worm-driven rear axle with a one-piece pressed steel housing has been adopted.

In the 1½-ton model the same style hood as in the 1-tonner has been adopted and the Ross steering gear of the fore-and-aft type in place of last year's cross-steering type is used. A new model of engine of the same size as that used in last year's truck is employed and is designed to give a better performance than the old type. The engine is fitted with Simplex centrifugal grid-valve governor, limiting the speed of the truck to 14 m.p.h. The Stromberg carbureter has been replaced by a Master and the clutch has been improved in its operation. The springs have been re-designed for lightness and flexibility as compared with those formerly used. They are interchangeable with those of the new model. The Timken axle with a one-piece housing is used with larger brake drums than those of last year's model.

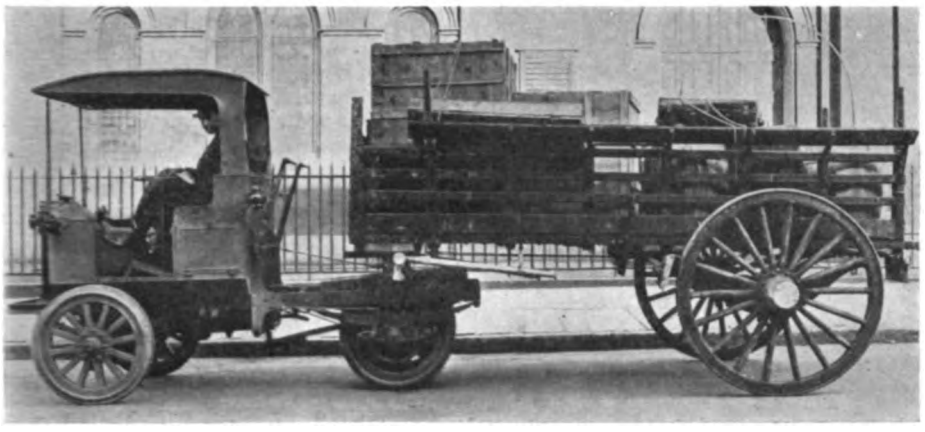
The 2-ton model has a slightly larger engine, 4¼ by 5½ instead of the former 4⅛ by 5½. Like the 1½-tonner the 2-ton model has a Simplex governor, Master carbureter, improved clutch, new springs, one-piece pressed steel rear axle housing and wider brake drums. The same engine is used in the 3½-tonner as in the 2-ton model. The former has been improved on along the same lines as outlined for the 2-tonner.

In the 3½-ton Special, the same axles are used as in the 3½-ton regular and



The Barber tractor, showing the solid rear axle and narrow 24-in. tread which makes possible the elimination of the differential

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The Barber tractor and horse-wagon trailer. Note the trailer front-leg device for supporting the trailer alone during loading and unloading to conserve time

are interchangeable except for the gear ratio. The chief improvements in the 3½-ton Special are the use of the Master carbureter, fitting of the Simplex governor, more careful workmanship on the engine and the use of an automatic spark-advance magneto in place of the hand-controlled type.

Very few changes have been effected in the 5-tonner. Those which stand out are the introduction of the Ross fore-and-aft steering gear, the Master carbureter instead of the Stromberg, a slightly decreased gear ratio providing a trifle more speed with practically the same power as formerly.

Other features are the use of the Eisemann automatic spark-advance magneto in place of the hand-controlled type and re-designed rear springs which provide more room between the springs and the frame.

Barber Tractor Has No Differential—Rear Wheels Have 24-In. Tread

BARBER SPECIFICATIONS

Capacity, lbs.	12,000
Price	$2,500
Wheelbase, in.	84
Tires, front	34x3½
Tires, rear	34x4
Bore, in.	4¼
Stroke, in.	5½
N. A. C. C. hp.	29.00
Speed, r.p.m.	
Speed, m.p.h.	12.13
Gear ratio in high gear	
Final drive	Worm

HAVING no differential, the Barber tractor, made by the Barber Motors Corp., Brooklyn, N. Y., is a short wheelbase, worm-driven vehicle in which the differential has been eliminated by placing the two rear wheels inside of the frame proper. This construction gives a rear tread of but 24 in. and permits of the elimination of the differential for the reason that the difference in the rotation of the wheels when the vehicle is turning a corner is reduced to a minimum.

The close placing of the rear wheels and the elimination of the differential means a reduction in the cost of the rear axle and also permits of an essentially three-point suspension of the vehicle, besides tending to reduce skidding. The close placing of the rear wheels is designed to give better traction, especially on country roads, as the 24-in. tread permits the driving wheels to run in the space between the wagon ruts which is usually well worn down and packed due to the continued beating of horses' hoofs.

The vehicle is further characterized by an unusual method of rear spring mounting and a novel fifth-wheel arrangement by means of which the trailing vehicle can be disconnected from the driver's seat through the medium of a system of levers and cables.

Old horse wagons may be utilized as trailers for use in connection with the tractor, provided the trailer axle bearings are replaced by better-lubricated ones which will stand up under the tractor speeds of from 12 to 13 miles per hour.

The Barber company also provides a patented front-leg device for use with the trailers, so that the latter may be left standing while being loaded or unloaded without the use of cumbersome wooden horses or jacks. As shown in one of the accompanying illustrations, the leg device consists of a crosswise bar beneath the front end of the trailer. To this bar are connected two pipe stanchions with transverse braces leading from their midpoints to the crosswise bar. The latter is carried in two bearings, one on either side of the trailer, and may be swung downward to a vertical position to support the trailer front end. The vertical arms of the device are kept from tilting over and allowing the front end of the trailer to drop to the ground by means of two removable side braces. The upper ends of these are attached to the side-sills of the trailer floor by means of bolts inserted in holes in the braces and corresponding holes in the sills.

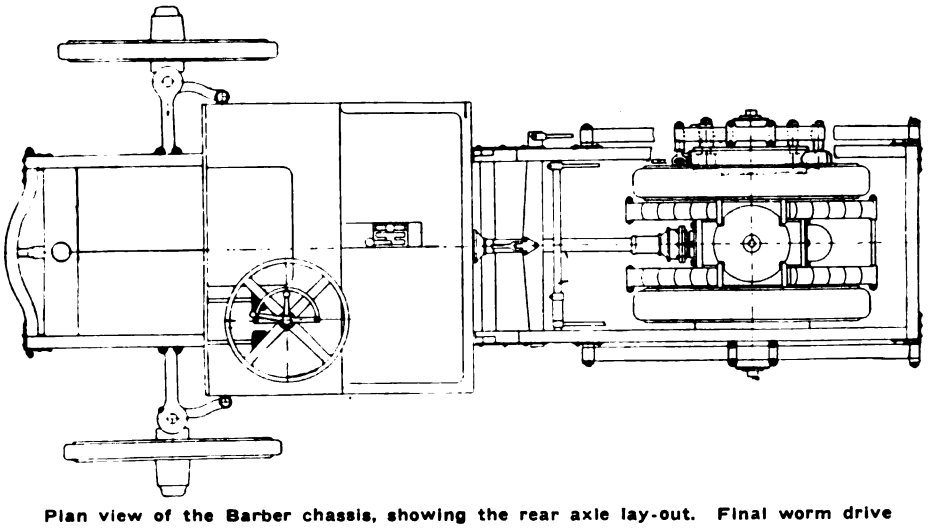
The tractor has its engine mounted under a hood between the seats. It is of Buda manufacture and has its cylinders cast in block with the valves at the right. It is cooled by means of a square-tube cast-iron-case radiator in which water is circulated by means of a centrifugal pump. The radiator is placed forward and flanked on either side by short metal pieces forming a dash of the Roman type.

The engine is fed by a Stromberg carbureter with gravity feed from a tank located under the driver's seat. No governor is fitted, but the maximum speed of the tractor and 6-ton trailer in high gear is between 12 and 13 m.p.h.

The ignition is on the single plan, employing a high-tension Bosch magneto with a hand-controlled spark advance. No electric starting or lighting equipment is furnished.

From the engine the drive is taken through a Fuller & Sons dry-multiple-disk clutch to a three-speed selective gearset of the same make, both of which parts are mounted in a unit powerplant with the engine. From the gearset the drive is transferred through a short driveshaft with a universal at each end to a worm gear driving the patented Barber rear axle. This is of the solid type with the vehicle wheels carried on its outer ends.

Between the two wheels the axle housing carries two spring pads which sup-



Plan view of the Barber chassis, showing the rear axle lay-out. Final worm drive is used

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The trailer disconnected from the Barber tractor, showing the novel fifth-wheel and trailer front legs

port two full elliptical springs to hold the fifth-wheel device. In this manner the front end of the trailer load is supported on its own set of springs, which are entirely separate from the conventional rear springs of the tractor itself. The latter are mounted on the extreme outer end of the solid rear axle, which is extended so that the springs can be pinned to the outside of the tractor frame. The forward end of each rear spring is rigidly pinned to the frame in order that they may take the driving stresses. The torque of the rear axle is taken up by a triangular-shaped torque arm attached to a cross bar and framework bolted to the tractor frame directly aft of the driver's seat.

The brakes, which are of the internal-expanding and external-contracting types, are both carried on the outside of the wheels. Each is 20 in. in diameter and 3 in. wide. The brake hangings are lozenge-shaped castings which also serve as spring pads for the tractor rear springs.

The frame is of rolled-channel steel and is made up in the semi-flexible type.

First Nash Truck Is a 1-Tonner Using Internal-Gear-Driven Axle

NASH SPECIFICATIONS

Capacity, lbs.	2,000
Price	$1,450
Wheelbase, in.	130
Tires, front	34x3
Tires, rear	34x4
Bore, in.	3¾
Stroke, in.	5¼
N. A. C. C. hp	22.50
Speed, r.p.m.	1,345
Speed, m.p.h.	20
Gear-ratio in high gear	
Final drive	Internal gear

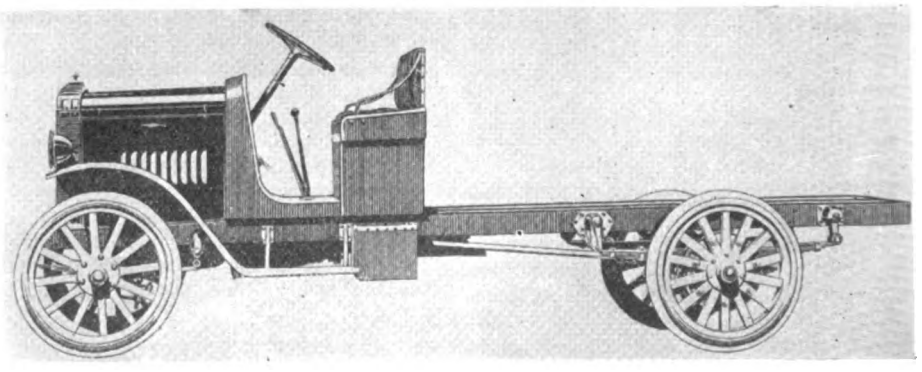
THE first truck brought out by the Nash Motors Co., Kenosha, Wis., under the name of Nash, is a 1-ton internal gear-driven job which is very similar in many respects to the previous Jeffery 1½-tonner, whose specifications were published in the November 1, 1916, issue of THE COMMERCIAL VEHICLE.

The Nash 1-tonner sells at $15 less than the Jeffery 1½-ton unit; has the same wheelbase and solid tires all around instead of pneumatics in front and solids in the rear as on the Jeffery.

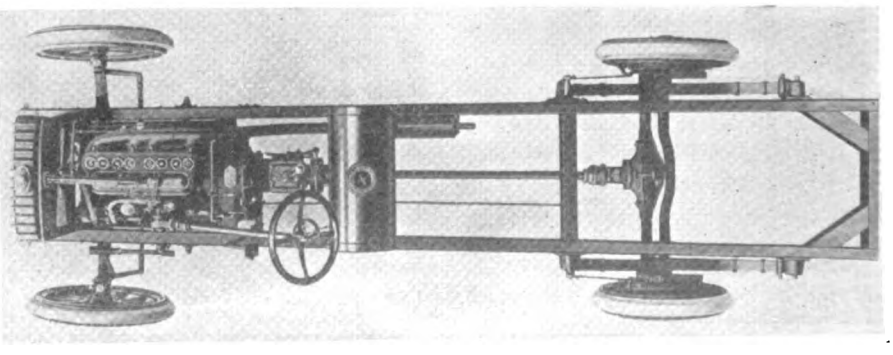
Both models have engines of the same bore and stroke with the cylinders cast in block and the valves at the right. The previous Jeffery model had a cellular radiator with a sheet-metal casing, while the new Nash vehicle has a square-tube type with a cast-iron casing. While the former Jeffery model employed a high-tension Dixie magneto for the ignition, the Nash truck employs the Delco system with a storage battery and generator as the two current sources.

Like the Jeffery, the Nash employs a stock two-unit Bijur starting and lighting system. The new Nash has a Simplex governor limiting the speed of the truck to 20 miles per hour, whereas the Jeffery model had a Duplex governor controlling the maximum speed of the truck to 16 m.p.h.

Both types use Stromberg carbureters with gravity feed from a tank under the driver's seat in the Nash and from a dash tank in the case of the Jeffery. Both models employ three-speed selective gear-sets mounted in units with the engines; take the torque through the springs in each case, use Celfor internal-gear-driven axles, and employ left steer and center control.



Side chassis view of the new Nash 1-tonner, which has a cast-case radiator, unit power-plant and internal gear drive



Plan view of the Nash 1-ton model. Note the unit powerplant assembly and the Celfor internal-gear-driven axle

Ideal French Ambulance

(*Continued from page* 20)

ture about the ambulance open to criticism, for water condenses in the manifold and passes to the tank and the carbureter. A Pyrene fire extinguisher is carried on the front panel of the body, to the left of the driver. This is an obligatory and essential accessory on all French army motors and on most Italian vehicles. In addition to the headlights, there are two side lamps. It will be noticed that they are mounted on the forward face of the body, to the left and right of the driver, and indicate practically the full width of the vehicle.

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This method of mounting is a detail of very practical value; there is a glass disk in the rear of each lamp registering with a circular hole in the body panel. Thus the lamps show a light ahead and also illuminate the inside of the ambulance. By reason of their position the driver can cover up the face of the lamps without leaving his seat, when working front line positions in view of the enemy, yet without abolishing the light inside.

There have been many unsatisfactory solutions of the inside lighting problem. Electricity is both too costly and too delicate for the average ambulance driver at the front. Even on ambulances like the Buick, fitted with Delco ignition and lighting, the inside light always gave a considerable amount of trouble owing to bulb breakages and short circuits.

Standardized Tires Save Time.

Spare tubes are not issued to drivers of these ambulances, the two spare wheels being quite sufficient for the runs they have to undertake. As there is only one size of tire, changes can be made under the control of an experienced man at the depot from which the ambulances work; or a few spare wheels can be maintained there for use in rush periods when drivers have not time to stop and change a tire. In these cases they take a new wheel and tire, leaving the old one to be changed by the mechanic on duty at that point.

Although there is a rear overhang beyond the center of the axle of 41 inches, these ambulances are remarkably well sprung and have better riding qualities than many high-class passenger cars. The addition of a shock absorber, such as the Houdaille, still further improves them. This, however, is not a standard fitting. Final gear ratio is 5 to 1; this with a four-speed gear set is quite satisfactory, and enables the ambulances to meet any conditions of front-line work to be found on the western front; obviously, however, a judicious use has to be made of the gears. Most of the Buick ambulances in France have a final ratio of 6 to 1, with three speeds. With the bigger engine and this ratio they are practically top-gear cars in all ordinary country, and are faster than the Fiats on moderate hills. For really difficult hill work, however, their three speeds handicap them and make them inferior to the Fiats.

The Buick chassis is the American machine most commonly used by the various European armies and the Red Cross associations attached to the armies. The bodies fitted to these chassis are varied, some of them being poor and some approaching the French standardized type. The American Ambulance in Paris has a certain number of these latter in service. As will be seen from the sketches, their overall dimensions are bigger than the regulation French type. Further, they carry but four stretchers, the stretcher carriers being formed by the hinged seats and by rails hinging from the walls. The loading arrangements are inferior, for the stretchers have to be pushed in on fixed rails, which always present a certain amount of difficulty. These Buicks are registered to carry eight sitters; in reality many of them run regularly over rough roads with thirteen sitters, five each side, one at the head of the gangway, one in front. and the driver, without being any the worse for it. As stretcher cases are the most difficult to handle, a modification of these bodies to take five stretchers would be a vast improvement.

Kissel Brings Out Closed Truck Cab To Increase Driver's Efficiency

THE motor truck driver's efficiency should be increased through the use of a new all-year convertible cab just brought out by the Kissel Motor Car Co., Hartford, Wis., which will fit it on all Kisselkar trucks except the light delivery model. The winter inclosures are not included in the standard equipment and must be purchased extra. It is a new adaptation of Kissel's original convertible idea, giving to truck drivers a closed, warm cab in winter, and one which can be easily and quickly changed into an open cab in summer.

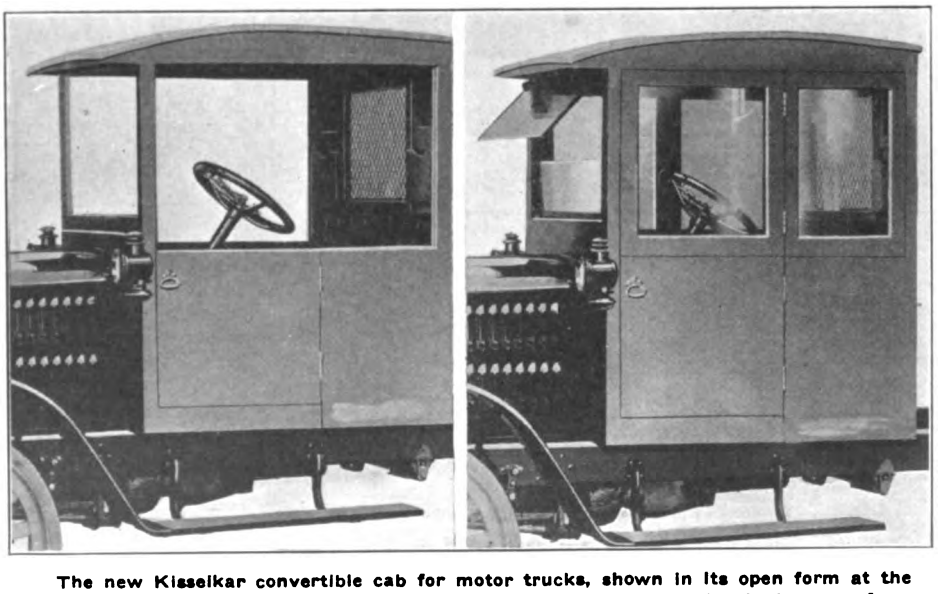
The cab is a little over 5 ft. from chassis frame to roof. The cab frame is of extra hard wood, bolted and locked. All sides and doors are covered with sheet metal, enabling the cab to withstand the twists of the frame when negotiating rough roads.

The cab has a seating capacity for three, with plenty of leg-room. The tank and tool compartments are under the seat. The doors on each side are 25 in. wide, an unusual width for truck cabs. Metal pockets are furnished on both sides of cab for time, tire, gasoline and other mileage record cards and books.

The instrument board is set at right angles, with plenty of space for all the necessary electrical instruments, speedometer, gauges, etc. Pittsburgh glass is furnished for the doors, sides and rear window, which has a heavy wire protection screen. A rain-vision windshield is also included with the winter equipment.

The cab is designed to be wind-proof, rain-proof, cold-proof, in fact, all-weather proof, giving the driver a warm, dry, comfortable housing in winter under all climatic conditions.

To change from the winter to the open summer cab, the winter inclosures, consisting of windshield, side, door and rear windows, are easily and quickly removed.



The new Kisselkar convertible cab for motor trucks, shown in its open form at the left for summer driving, and closed at the right for winter work. In its open form it will be fitted as standard equipment on all Kisselkar trucks except the light delivery model

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Utilitarian Bodies Utilizing Advertising Value

Convertible Box and Stake Type, and Dairy Truck Painted White

Convertible Body With Hoist

CONVERTIBLE at will from an ordinary box-type body into a stake style, the unusual outfit shown in Fig. 4 is used by a Pittsburgh, Pa., contractor to deliver a great variety of commodities. When used in the contracting business for the haulage of sand, gravel, cement and the like, the ordinary flareboard box-type body shown at the left of Fig. 4 is employed. The body is equipped with a Wood hydraulic hoist, made by the Wood Hydraulic Hoist & Body Co., Detroit, so that material such as sand and gravel can be dumped readily in a few seconds' time.

During the slack season in the contracting business the owner, Antonio Napeltano, uses the vehicle for handling coal, coke, feed, furniture, freight, plumbers' supplies, and other bulky articles. Such goods are carried by means of fitting slat sides with a pipe-frame top, over all of which a tarpaulin is thrown to protect the goods in stormy weather.

As shown in Fig. 4, the ends of the three side stakes forming the body side are inserted through notches cut in the flareboard on each side and held in place by means of U-shaped flanges at the bottom.

Nothing whatever is taken off the truck when its body is being changed from a dump to a stake type. All that is necessary is to lift the framework of the stake slats upward and then let the ends of the stakes drop into the grooves in the flareboards.

The body is made of wood and is 6 ft. wide, 12 ft. long, with sides 16 in. high, with 7-in. wingboards. The body has a considerable overhang aft of the centerline of the rear axle, so that when it is elevated by means of the Wood hoist, its rear end is between 8 and 10 in. nearer the ground than is the case on the ordinary dump truck. The body is mounted on a 3-ton worm-driven Packard.

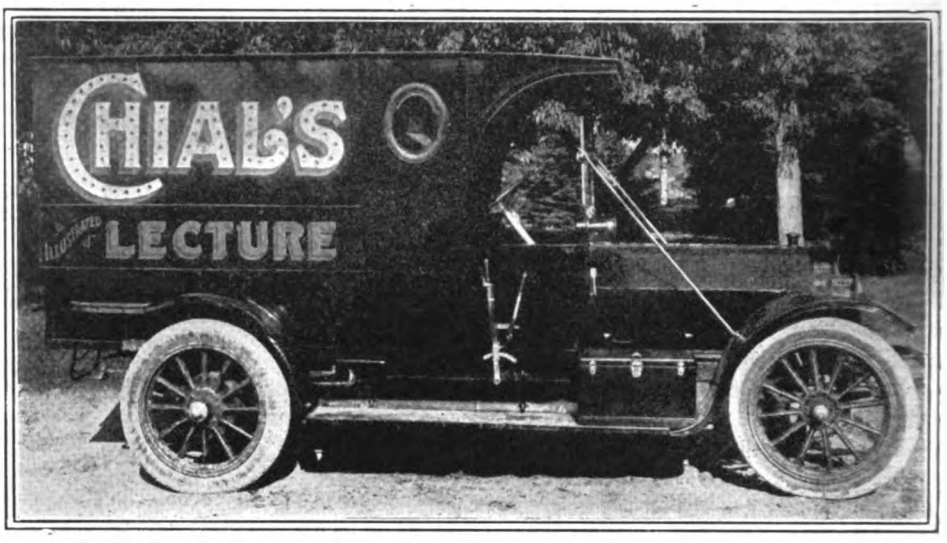


Fig. 2—Chial's Kisselkar used to transport his lecture equipment from town to town. The body is featured by an unusual electric sign on either side of the body panel. The current for the sign is secured from a storage battery in the truck body that is charged by a generator driven off the vehicle engine

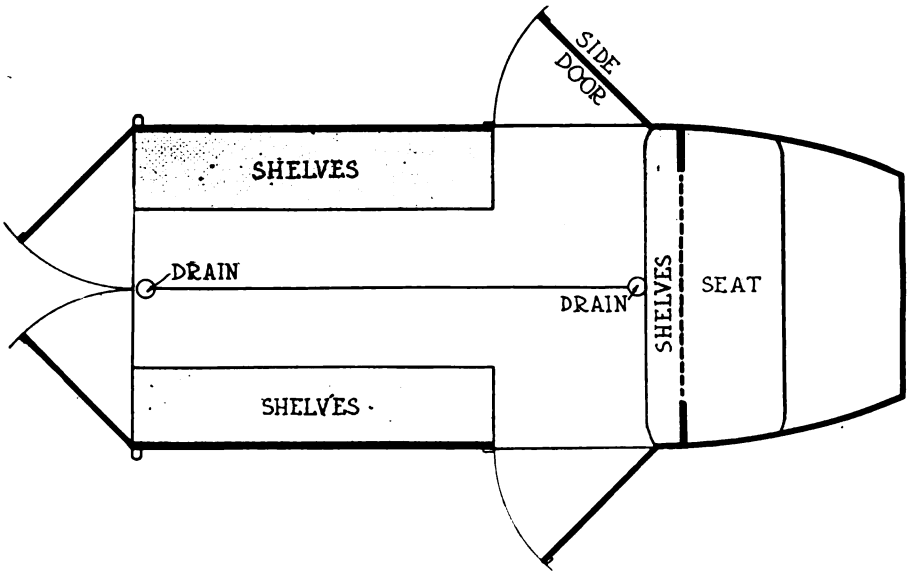


Fig. 1—Plan view of the novel dairy body mounted on the 1¼-ton Wisconsin truck owned by the Pinehurst Farm Dairy. Note the large side doors which make for easy loading and unloading. Also notice the side and front end shelves on which dairy products such as butter, cheese and eggs are carried, leaving the clear inside portion of the body for cans of milk and bulky packages like tubs of butter. The drip from melted ice, used to keep the products cold, drains toward the center of the body and is carried off to the ground through two pipes, one at either end, as indicated

Unique Electric Signs on Sides

UTILIZING the advertising possibility of the motor truck, Chial, a traveling lecturer, has employed an electric sign somewhat similar to that used on up-to-date billboards, on the sides of his Kisselkar truck, by means of which he carries his complete outfit from town to town. The sign itself is made up of letters with electric bulbs spaced equally on the painted forms of the letters. These bulbs are wired up and are illuminated at night by means of current secured from a battery carried in the truck body and charged during the day time while the truck is in motion through a special generator driven by the truck motor. The body, which is of the panel type, is made of metal in several sections, as can be clearly seen in Fig. 2. It is undercut on either side in the way of the rear wheels and is protected from mud-splashing by leaving the regular passenger car fenders in place.

Side-Door Dairy Body

PAINTED white to associate it with the cleanliness of the dairy products which it delivers, the unusual type of body mounted on the Wisconsin 1¼-ton truck shown in Fig. 3 employs side and end doors for rapid loading and unloading.

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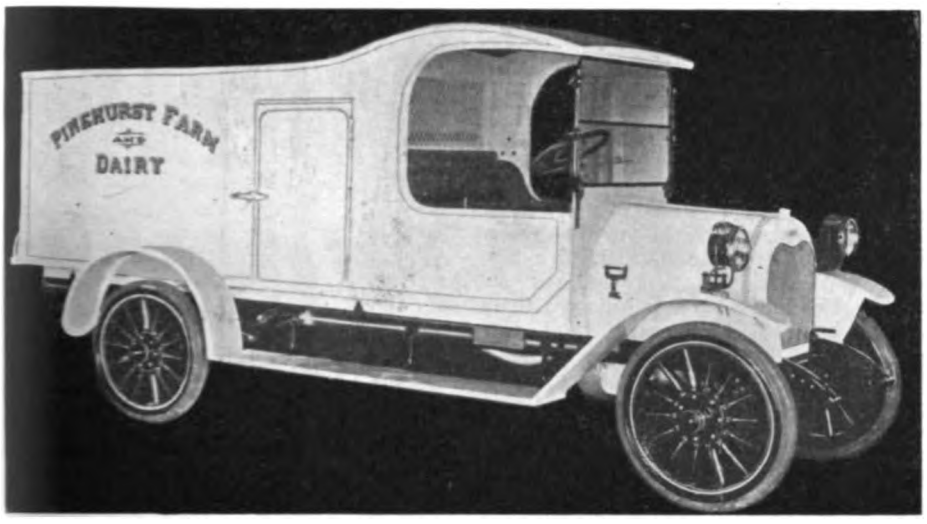


Fig. 3—The dairy body, the interior of which is shown in Fig. 1. Note the integral roof of the driver's cab and the body proper. This body utilizes its advertising value by being painted white to associate it with the cleanliness of the product which it carries. Even the engine hood, dash, fenders and runningboards are painted white. An especially comfortable driver's cab is secured through the use of a built-in windshield, fore-doors, and side curtains which may be unrolled from the cab top

The interior layout is perhaps the most interesting part of the body construction aside from the pleasing curves of the roof of the driver's cab, which is in a unit with the top of the body proper. The side doors are hinged vertically directly aft of the driver's seat and swing outward toward the front so that the goods may be gotten at readily from either side. The doors are sufficiently large to admit of the conventional milk can.

Besides the cans of milk which are carried, the body is also utilized to deliver other dairy products, such as butter, cheese and eggs. Small quantities of these commodities are carried on shelves along the sides and at the front of the body directly behind the driver's seat. For ventilation there is a screen in the front end of the body extending from the top of the padded back of the driver's seat almost to the top of the body.

Taking care of the drain water from ice used to keep the products cold while in transit is cleverly worked out by slanting the body floor toward the center with drain pipes at either end. The spouts of these drain pipes are carried down below the running gear of the truck, so that the dripping water will not continually splash against the rear axle or brakes or tend to rust any of the driving mechanism.

In keeping with the whiteness of the body proper, even the engine hood, fenders and runningboards are similarly painted snow white. The driver's cab is provided with side doors and with a built-in windshield, so that it is very comfortable in inclement weather. The Wisconsin truck shown is manufactured by the Myers Machine Co., Sheboygan, Wis.

Send Us Ideas on Good Truck Repairs

See pages 22 and 23

Book Reviews

Novel Dealer Merchandising has been started by the H. A. Dougherty Motor Co., Kansas City, Mo., Republic truck dealer, in the form of a booklet advertising the firm and the truck it sells. In it is a list of the Kansas City Republic owners, stating the number and model of trucks they own. An argument in favor of motor trucks in general, a description of the Republic plant and product, and a record of the local firm are presented in a forceful fashion.

"Would You Hitch a Wagon to a Kangaroo?" inquires the Duplex Truck Co., Lansing, Mich., on the cover of a leaflet advertising its products. It is assumed that the kangaroo has poor tractive power, and the assigned reason is that he is of rear drive construction, which leads the Duplex company to arguments in favor of four-wheel drive both front and rear. Views of the Duplex trucks in action supplement the printed matter.

"Pennsylvania Metal Hose" is the title of a booklet issued by the Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa. Half-tones of the hose being put to various uses, descriptions of the product and a price list make up the chief material in the catalog.

"Duplex Doings," the house organ of the Duplex Truck Co., Lansing, Mich., has made its initial appearance. It contains personal items about the executives of the company, and write-ups of novel performances by Duplex trucks.

"Legal Points for Automobile Owners," by Leslie Childs, is a fifty-four page book explaining what the motor vehicle owner's liability is under different circumstances. The book is designed primarily for the general public and not for the law student, all legal terminology being excluded. The book is published by the J. S. Ogilvie Publishing Co., New York. Price, 50 cents.

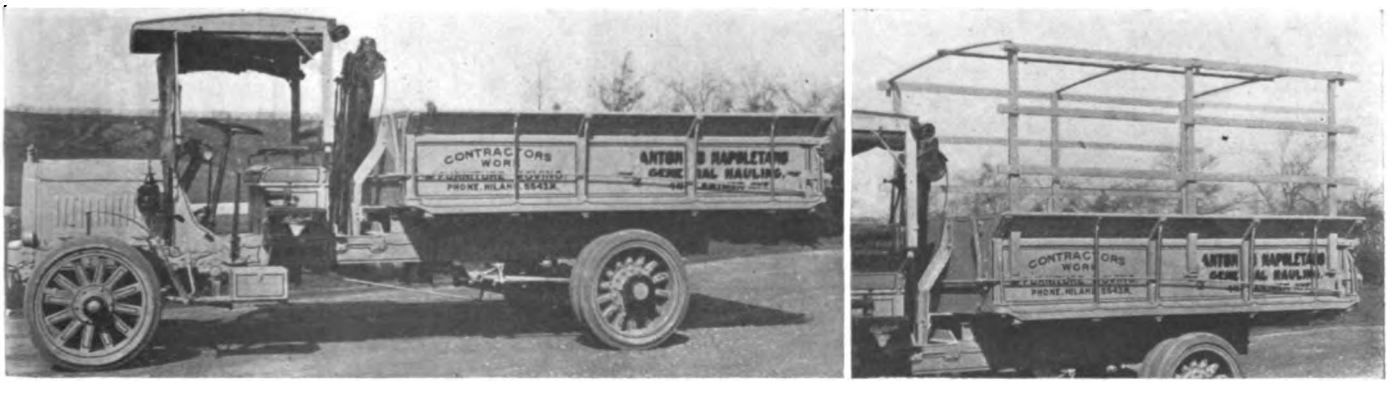


Fig. 4—The convertible and semi-staked type of body mounted on the 3-ton Packard owned by a Pittsburgh contractor who hires the truck out during the dull seasons to carry furniture, express matter and other bulky material. In this way the earning power of the vehicle is not restricted and is kept at a maximum so long as other than contracting work can be secured

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Teagle Inductor Magneto

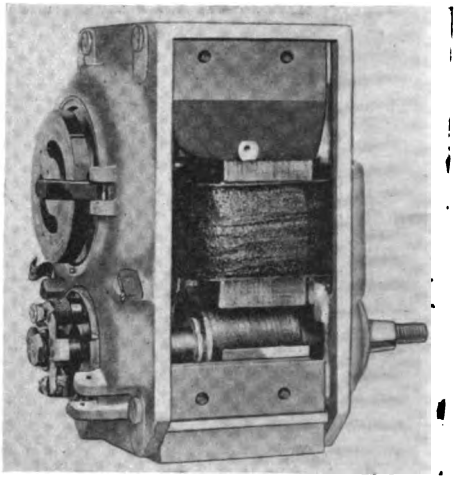
Specially Designed by Cleveland Company for Truck and Tractor Work—Both Fixed and Variable Spark Types Made

MORE than ordinary interest, in view of the conditions prevailing in the magneto industry, attaches to the announcement of the Teagle Co. of Cleveland regarding the introduction of the new Teagle magneto. This magneto is specially designed for use on truck and tractor engines, and differs radically in structure and principle of operation from the conventional type. Every feature involved is said to have been thoroughly tried out by experienced ignition engineers. Up to the present several models have been developed for both four and six-cylinder engines, of both the fixed and variable spark types. An impulse starter can be attached to any model.

The Teagle magneto, as already stated, is of the inductor type, which means that the coils in which the current is induced are stationary, and the revolving part or rotor consists merely of a block of laminated steel. Instead of horseshoe magnets, as always used in the conventional type of magneto, the Teagle magneto employs straight bar magnets, which are carefully ground and securely clamped to top and bottom yokes. The bottom yoke forms a pole piece extending nearly half way around the rotor tunnel, while the top yoke has two poles, one carrying the windings or coils and the other serving as a magnetic by-pass. The magnetic circuit is shown diagrammatically in the two accompanying sketches. In one the rotor pole is shown opposite the pole of a top yoke, which carries the windings or coils, and with the rotor in this position, the maximum flux passes through the coils. In the other sketch the rotor is shown opposite the end of the magnetic by-pass, and in this position all of the magnetic flux passes through the by-pass and none through the coils. As the rotor has two poles, the flux through the coils passes through a maximum and a minimum twice during every revolution of the rotor.

As all coils and current carrying parts are stationary, there are no slip rings or brushes, except the brush in the distributor. The distributor gears, of bronze and steel, are of ample dimensions, and in connection with the rotating member of the current distributor, are carried in steel and bronze bearings, the sleeve of which is cast integral with the front die casting. The base and top yokes are made of special electric gray iron, and are tied to the die-cast end plates by screws. They are located in place by dowel pins. The field structure is bored and ground as a unit, thus insuring accurate alignment of bearings and pole faces. The stationary coil, condenser and laminated pole piece are assembled as a unit and mounted integral with the top yoke.

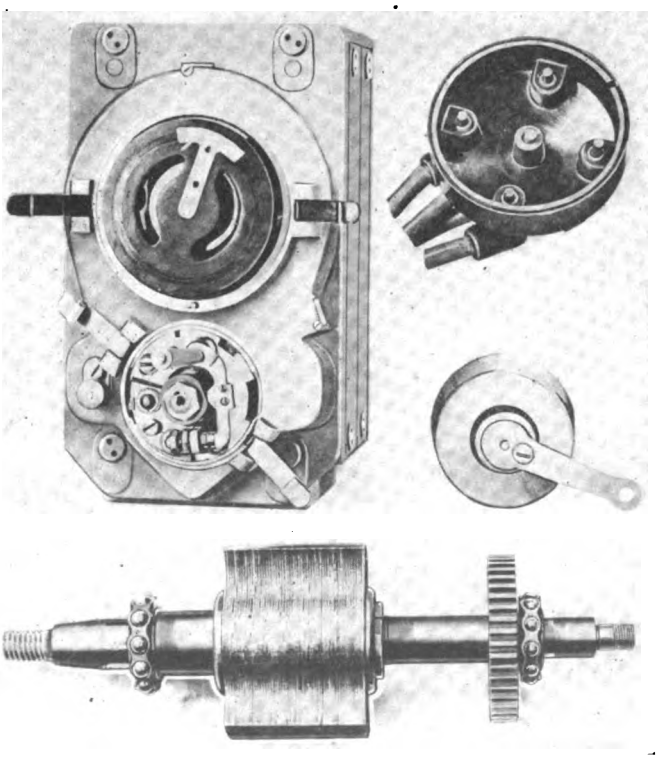
One of the illustrations shows the construction of the circuit breaker. This and the distributor, which are the only parts requiring occasional attention, are both readily accessible for cleaning or adjustment. All of the electrical connections are thoroughly protected by insulating material, and excess voltage strains are obviated by an inclosed safety gap, which is visible and readily accessible.



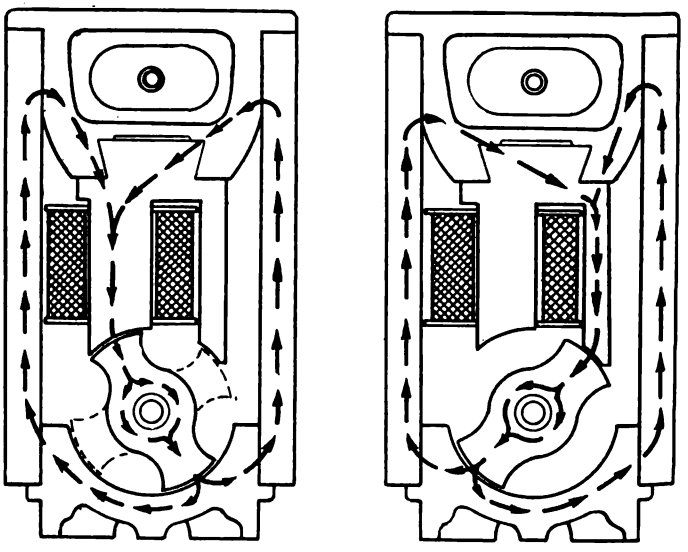
Teagle magneto with magnets removed, exposing the stationary winding

The Teagle magneto gives two sparks per revolution. The spark characteristics are said to be such as to insure very effective ignition, the current rising suddenly to substantially its maximum value at the beginning, and being well sustained. One feature that distinguishes the spark obtained from the Teagle from that obtained from other magnets is that it passes through the gap of the spark plugs in the same direction.

Owing to the straight form of magnets used, their heat treatment is facilitated, and the ratio of length to cross-section, which determines the permanency of the magnets, is said to have been so chosen that stability is assured. Owing to the fact that the coil is stationary and not subjected to centrifugal and other mechanical strains, there is no danger of its insulation being impaired. Norma bearings carry the rotor shaft.



Above—Teagle magneto, showing distributer and breaker box
Below—The laminated armature which carries no windings.



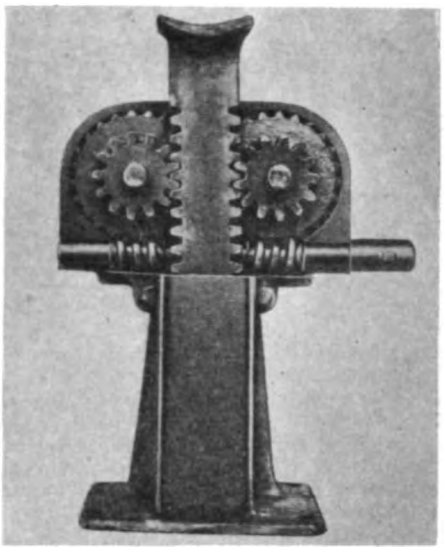
The winding is mounted on a laminated field structure provided with a magnetic bypass through which the flux is deflected twice in each revolution of the armature, as shown in the diagram at the right

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Rees Truck Jack Works on Worm Principle

A NEW line of lifting jacks has been placed on the market by the Service Corp., Pittsburgh, Pa. This company has been manufacturing jacks for industrial purposes for several years, and now has turned its attention to the truck field, for which it has developed two models, one suitable for passenger cars and motor trucks up to 2 tons capacity, and the other for trucks of 5 tons capacity. The mechanism of the jack consists of a double right- and left-hand worm meshing with two worm wheels. Each of these worm wheels is formed integral with a spur pinion at its side and these two pinions mesh with racks cut on the ram or hoist of the jack. The worm is made of crucible steel and the wheels are of malleable iron. The mechanism is self-locking and the ram can be raised and lowered only by turning the worm. To raise it, the worm must be turned clockwise, and to lower it anti-clockwise. The gear reduction is such that four and one-half turns of the worm raise the ram 1 in. The No. 1 jack weighs 12 lb. and the No. 2, 14 lb. The former has a maximum lift of 6½ in.

An interesting feature of the jack is the collapsible folding handle by means of which it is operated, which obviates the necessity of the operator crawling underneath the car in order to place the jack in position under the rear axle, and to operate it. This collapsible handle is made in three sections; when extended, it is about 3 ft. long, and when folded, about 18 in. It is provided with a socket fitting over the end of the worm shaft and a locking ring is provided which, when turned through a small angle, locks the handle on the shaft and prevents it from coming off. The jack can then be swung and shifted into position under the axle by means of the handle. A universal joint in the handle near the socket permits of operating it from difficult angles. This collapsible handle is preferred for passenger car use. For truck purposes the company has developed a ratchet-operating device on which a patent has been applied for.



The Rees jack, showing the worm gear mechanism through which it obtains its great power

Maltby Spray Primer for Trucks Is Simple

THE Maltby spray primer for motor trucks or passenger cars is a simple device designed on the plunger pump principle to spray gasoline fuel into the cylinder intake manifold to start the engine in cold weather. It is made by Frank D. Maltby, Battle Creek, Mich., and is shown below.

It may be attached to any type of motor and consists of a short cylindrical barrel with a plunger handle which may be inserted through or alongside of the radiator of a truck or through the dash, as desired. Near the bottom of the barrel is a plug at right angles to it. This contains a smaller interior tube with small pin holes in the end. When the plug is screwed into the manifold, the tube end is at the center of the manifold. In operation, the up stroke of the plunger handle sucks gasoline in through the end of the barrel from the main gasoline line. The down stroke forces it into the manifold in a fine spray sufficiently aërated to form a combustible mixture at low temperatures. By this means the engine may be started without difficulty, which is of importance with commercial vehicles due to the time saved.



The Maltby spray primer, showing general lay-out

Lessons of the War in Truck Design

(*Continued from page* 16)

upon the units they control and not be separately supported on the frame. Much of the derangement of parts caused by damage to the frame itself would be thus avoided.

Care should be taken in the adoption of a standard that all of the parts are enclosed and protected against mud and weather. I have seen an artillery ammunition park stationed at the roadside for such long periods ready to move toward the front that it was necessary to tie up the brake mechanism with canvas and to cover the radiator, wheels and other exposed parts in the same way to prevent them being rendered inoperative by the splashing of mud from other passing vehicles.

The English army uses principally one size of truck of 3-ton capacity somewhat larger than the U. S. Class A specification. Smaller trucks are called for to handle hay and oats, as these do not weigh so much as some of the other stores. In practice, however, these loads are very bulky and are carried in the largest body available.

The French standard trucks are 2 and 5 tons, the 2-ton truck being somewhat smaller than the Class A and the 5-ton truck being about the same as the Class B specifications.

The trucks are normally operated at from 12 to 15 m.p.h., but the governors are usually set to allow of a speed of 18 to 20 m.p.h. in an emergency. Very often the governors are disabled, and a great many trucks are not provided with governors at all.

Most of the trucks in France are geared so that their engines will operate continuously at 18 or 20 m.p.h. on high gear in emergency. They are also required to operate on second gear up to a normal speed of 12 m.p.h., so that in an undulating country the convoy is not spread out by vehicles slowing up on the hills. The later trucks designed have a reduction of fifty to one on low gear in order that they will maneuver on low and reverse under bad road conditions without it being necessary to race the engine in starting.

It is found in practice that even the axles do not suffer as much by this extreme reduction as by racing the engine and letting the clutch in, as is necessary with some older type trucks sent from America.

Many of the early trucks were found wanting on account of insufficient road clearance. This has been remedied in the later designs by the adoption of transmissions with the lay shaft placed sidewise of the main shaft by double geared rear axles and by the use of the heavier smaller diameter flywheels than formerly. The ground clearances demanded in the United States specifications are approximately what have been found necessary in practice in France.

For the sake of operating in narrow places rather than of turning around in a smaller circle it is necessary that steering to an extreme angle be allowed for. This turning circle limits the frame width, and it could be best specified by standardizing the width of frame of Class A truck to 33 in. and the width of frame of Class B truck to 34 in., which widths agree with the standard widths of rear spring seats and permit the use of a uniform 26-in. engine arm.

The standardization of tire treads is very important. The front tires should be the same gage on center lines as the rear tires rather than have the front and rear tires line up on their inner edges, as this makes steering very difficult and rubs the inner edge of the front tires. It will be found that this condition exists in the class A United States specifications.

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Men and Makers



REPUBLIC Motor Truck Co. will immediately erect a large addition to its plant at Alma, Mich., and will double its production capacity.

Triangle Motor Truck Co., St. Johns, Mich., has decided to build a factory. The company was recently organized with a capital stock of $50,000.

Peerless Motor Car Co., Cleveland, has completed extensions to be used for the manufacture of passenger cars, and has commenced the erection of a warehouse, 48 by 400 ft. The motor truck department of the company is employed to about its full capacity in trucks for England at the rate of fifteen a day.

The Nash Motors Co., Kenosha, already has started to place women in its core-room. In Milwaukee, the Cutler-Hammer Mfg. Co., Geuder, Paesche & Frey Co., and other large concerns closely identified with the motor vehicle parts and equipment industry not only are employing women in the shops in places usually filled by men, but they are advertising in the newspapers for more women for such purposes. The Allis-Chalmers Mfg. Co., Milwaukee, now employs a large number of women on mica-winding and other electrical construction of a light nature.

Denby Motor Truck Co., Detroit, will construct a one-story warehouse at Holbrook and the Grand Trunk Railroad.

Crescent Motor Truck Co., New York, has been formed to manufacture a 1500-lb. delivery car as an assembled proposition to sell around $1,000. The company has taken temporary quarters at 1457 Broadway. Production is expected to start by Sept. 1. The company is a closed corporation with a nominal capital of $6,000. J. W. Brooks is president.

Triangle Motor Truck Co., St. Johns, Mich., held a meeting of stockholders this week and arranged for the erection of a factory. The company has a capital stock of $50,000, of which $32,500 has been already subscribed.

Willys-Overland Co. will erect a building in Fresno, Cal., at a cost of $70,000 for sales and service purposes.

Old Reliable Motor Truck Co., Chicago, will build a two-story addition, 100 by 160 ft., to enlarge its plant at Michigan Avenue and Thirty-ninth Street.

Gary Motor Truck Co., Gary, Ind. in order to take care of increased orders, has decided to enlarge and has selected a plot of ground near its plant upon which it will build. A new building on the company's present land is being completed.

Selden Truck Sales Co., Rochester, N. Y., has declared a 5½ per cent dividend on its preferred stock. This is in addition to a 5 per cent dividend declared by the company 6 months ago.

Champion Motors Co., Inc., has opened general offices in Cleveland. The company's factory is in Fulton, Ill., and the concern plans to erect an assembling plant at Cleveland, to which the trucks will be shipped from the factory for assembly for the Eastern market.

Duplex Truck Co., Lansing, has started excavating for its new factory building and plans to have the building completed and ready for business by January 1, 1918. It is expected that the building and the machinery to be installed will cost $200,000.

Automatic Control Trailer Co., Columbus, Ohio, with offices in the Hartman Building, which was formed about 6 weeks ago for $25,000, has turned out its first trailer. Officers of the company are: S. A. Kinnear, president; Charles Seaman, vice-president; John T. Price, secretary-treasurer.

Gaston, Williams & Wigmore, exporters and importers of motor vehicles and accessories, have moved their offices from the Guaranty Trust Co. Building to the Equitable Building, 120 Broadway, New York.

Britton-Ransom Co., Boston, Mass., New England distributor for the Bethlehem and Maccar trucks, has moved from Cambridge to the junction of Brighton and Commonwealth Avenues, Boston.

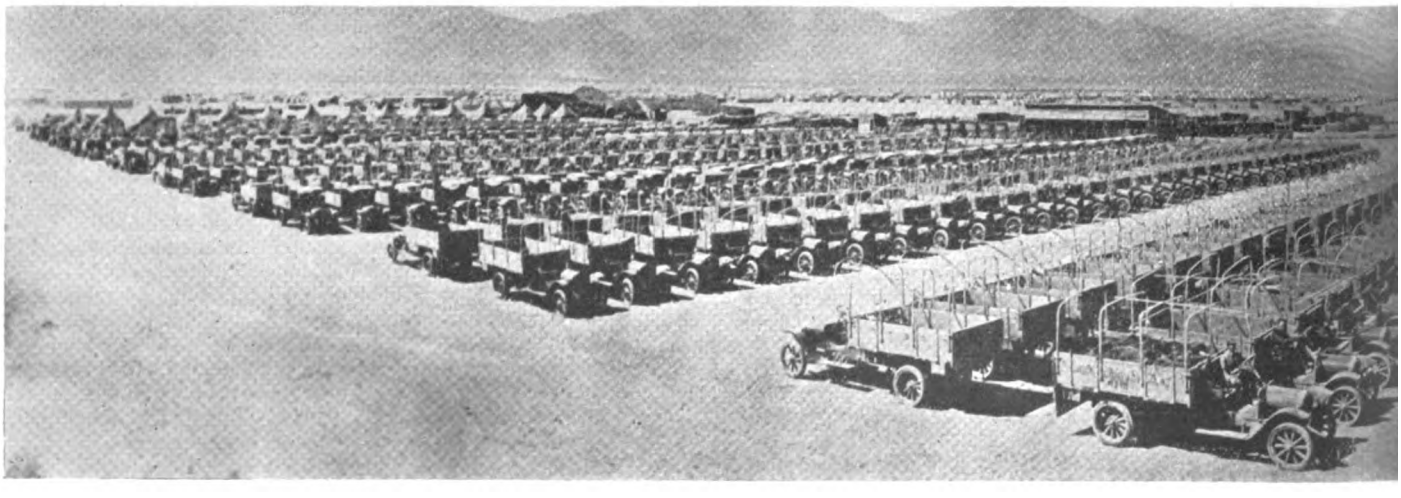
Dalzell Motor Truck Co., Youngstown, Ohio, will distribute Niles trucks in 20 counties in Ohio and Pennsylvania, including Allegheny.

United Line Service Corp., distributor of United trucks and tractors in New York, has moved into a new sales and service station at Eleventh Avenue and Fiftieth Street.

Wilson Body Co.'s plant, Bay City, Mich., construction of which recently started in that city, is being rushed to completion and will be ready for occupancy by Aug. 1.

Templar Motors Corp., Cleveland, has commenced the erection of a one-story building, which will be the first unit of its plant. Manufacturing will commence in about 30 days.

Detroit Pressed Steel Co., Detroit, is to erect a four-story factory building. Alterations are to be made upon three of its present plants.



Here is the White answer to the frequently heard charge that the United States was unprepared for Mexico and is unprepared today. Although the army supplies are not sufficient for a gigantic war, yet on the Mexican border and to-day the products of the American truck firms have shown efficient service. This fleet of White trucks, stretching as far as the eye can see, is a part of the White squadron quartered at Fort Bliss, Tex. Most of the vehicles in the picture saw

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General Electric Co. has removed its New York offices from the Hudson Terminal to the Equitable Building, 120 Broadway.

Geronimo Motor Co., Enid, Okla., will build a factory 65 by 300 ft., with a 40 by 65-ft. wing.

Kol-Ben Mfg. Co., Grand Rapids, Mich., capitalized at $200,000, is to be the name of a new company to manufacture hubs for wire, wood and steel wheels.

Minneapolis Steel & Machinery Co., Minneapolis, Minn., will spend $325,000 to get ready to make truck and tractor engines in expectation of a heavy development and demand in the Northwest after the war.

Independent Foundry Co., West Allis, Wis., has been organized by a group of expert foundrymen of the big manufacturing suburb of Milwaukee to manufacture gray iron castings for the gas engine and other metal working trades. Plans are being prepared for a foundry unit, 85 by 100 ft., with auxiliary buildings. The owners of the new company include August M. and Joseph Fonz, Joseph Budzinski, Frank Sprader and A. W. Tabbert.

Warner Gear Co., Muncie, Ind., will establish a grocery exclusively for employees.

Westinghouse Electric & Mfg. Co., Pittsburgh, Pa., has discontinued the Chicago branch of the automobile equipment department with the resignation of M. W. Hanks, formerly local representative. The district will now be combined with and handled from Indianapolis by H. S. Johnson, with the title of western district representative. Mr. Hanks has taken up standardization work with the Society of Automotive Engineers.

Universal Motor Co., Tulsa, Okla., will build a four-story assembling plant, 140 by 150 ft.

Lansing Body Co., Lansing, Mich., is manufacturing ambulance bodies for the Government.

Boone Tire & Rubber Co., Sycamore, Ill., and Des Moines, Iowa, has awarded contracts for the construction of the first unit of its new factory at Chippewa Falls, Wis. The building will be of fireproof construction, 100 by 200 ft., and will be ready in the early part of August.

Firestone Tire & Rubber Co., Akron, Ohio, will erect a building of four stories in Detroit. It is to cost $500,000 and to be used for sales and stock purposes.

Eisemann Magneto Co. has opened a sales office at 910 South Michigan Avenue, Chicago.

Britton Carburetor Co., Indianapolis, has been formed with a capital of $15,000. Carl G. Fisher, president of the Prest-O-Lite Co. and the Indianapolis Motor Speedway, is one of the incorporators. Associated with Mr. Fisher are Charles G. McCutchen and Quintin G. Noblitt.

Champion Spark Plug Co., Toledo, Ohio, is turning out 70,000 complete spark plugs daily and plans a total production of 20,000,000 for 1917.

Standard Woven Fabric Co., Walpole, Mass., has opened an office at 1834 Broadway, New York, in charge of Tom Howard.

Gemco Mfg. Co., Milwaukee, Wis., is awarding contracts for the construction of a three-story factory addition, 50 by 150 ft., which will cost about $100,000 with complete equipment. The new factory will be practically a duplicate of the present main shop, and will enable the company to double its production of bumpers, shock absorbers, jacks, lamps and other accessories.

Zenith Carbureter Co., Detroit, is planning new additions to its plant, contracts having been let for a one-story factory.

Hartford Automobile Parts Co., Hartford, Conn., has completed a new catalog describing its products, including universal joints and cone clutches. The catalog is very complete, giving a brief history of the company and a full description of its products.

Niswander Mfg. Co., Quincy, Ill., has been formed to manufacture demountable rim removers, rim tools and motor vehicle parts.

Xylite Grease & Oil Co., Port Huron, Mich., has closed a contract with Great Britain for oil and grease for trucks, etc.

S. F. Bowser & Co., Fort Wayne, Ind., which instituted a 2-day campaign for the Liberty Loan, reports that it was a success. As a result, 91 per cent of the 1566 factory and office employes bought bonds to the amount of $130,950.

H. H. Howe has been appointed sales manager of the Acason Motor Truck Co., Detroit, Mich. He was formerly with the Maxwell Motor Co.

Harry L. Shepler, vice-president in charge of production of the Willys-Overland Co., Toledo, will resign July 1. Mr. Shepler's plans for the future are not yet ready for announcement. He has wanted to resign from the Willys-Overland Co. for several months owing to his desire for a complete rest. Harry L. Shepler has been associated with the motor vehicle industry since its inception, and has been connected with the Willys-Overland company since 1909, first as superintendent, then as general superintendent, and finally vice-president in charge of production. He is one of the most important figures in the motor car industry.

C. S. Mott, one of the directors of the General Motors Co., has been summoned to Washington by Howard E. Coffin to confer with the Council of National Defense.

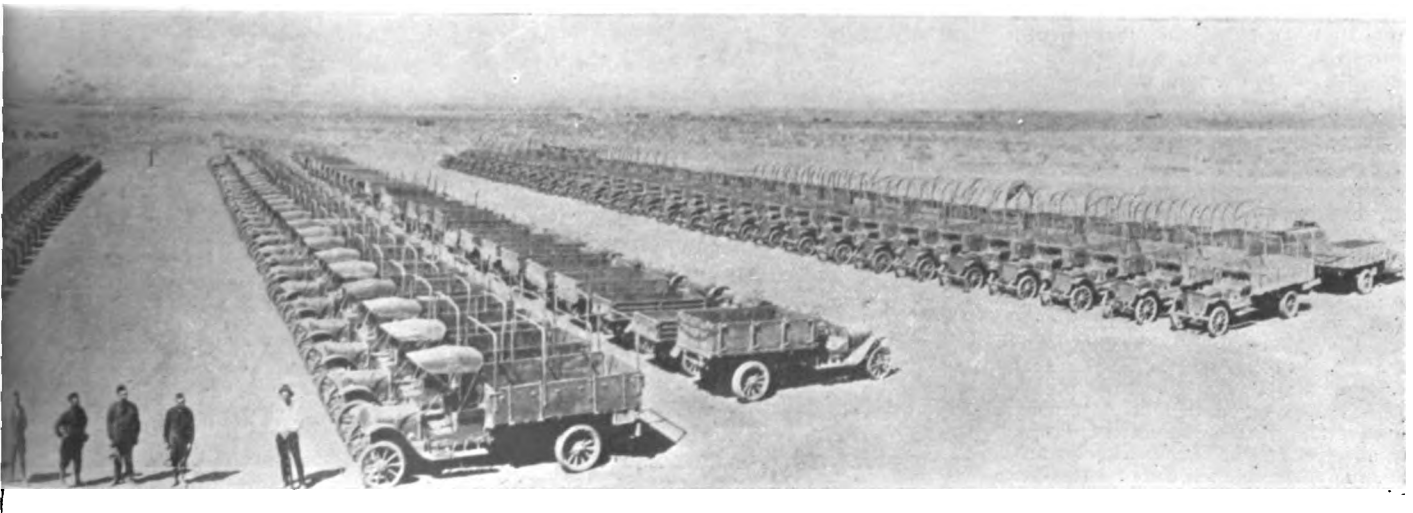
J. H. Williams, Seattle, has become sales manager of the newly-organized Gersix Motor Truck Co.

William R. McCulla, of the engineering staff of Willys-Overland Co., is about to return to England to again take up army duties.

Anton Kuckuk, a director of the Four Wheel Drive Auto Co., Clintonville, Wis., has made an offer to the Second Field Hospital, Wisconsin National Guard, with base at Madison, of a 3-ton F. W. D. truck, completely equipped, and valued at about $4,500, on condition that the people of Madison and vicinity will provide two additional trucks necessary for fitting out the hospital corps.

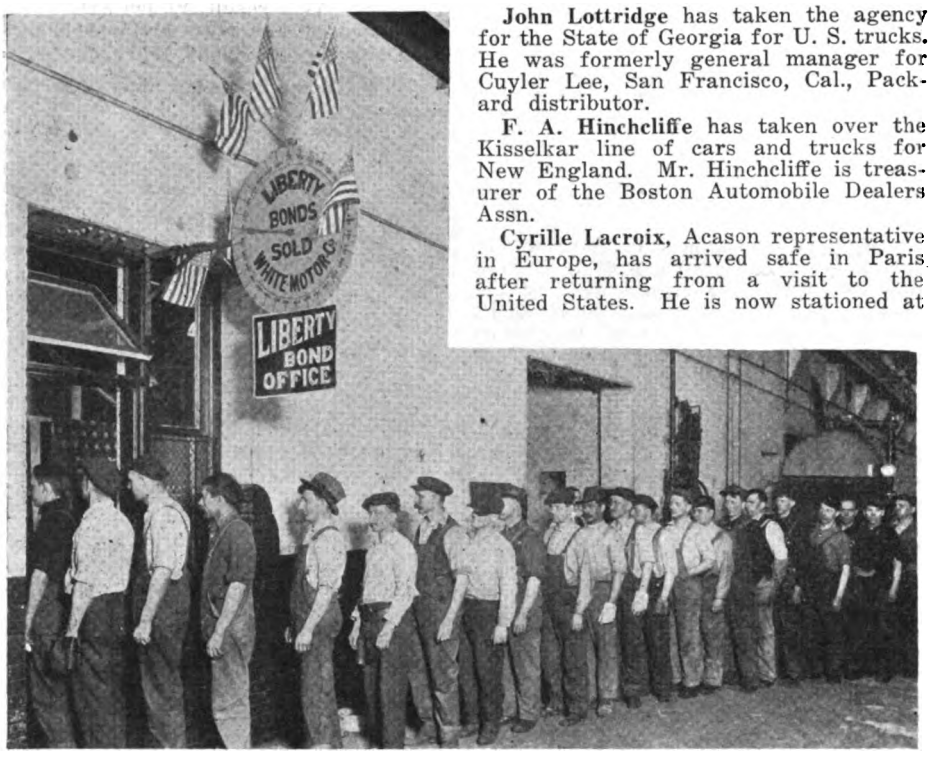
Carl Jeffries has been appointed chief engineer of the Detroit Truck Co., Detroit. Jeffries was formerly with the Lozier, Studebaker and Reo companies. Harry Peirce has been appointed purchasing agent of the company. He was formerly with the Regal Motor Car Co.

W. H. Birchall, superintendent of the Willys-Overland Co. plants, has been appointed general superintendent to succeed Mr. Shepler, resigned.



active service at the time of the punitive expedition into Mexico, and they are ready for further usefulness. The White and other truck units in the army service are destined to play as important, if not as romantic, a part in the war as the aeroplane service. The right of way to the front is given to the motor transports in France, and orders are given to run down everything in the road that does not get out of the way, which indicates the vital need for this branch

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Probably no industry has responded more enthusiastically to the country's need in war than the motor truck industry. Factories, brains, and wages have been given freely for patriotic purposes. Here is a line of White employees helping to make the world safe for democracy

John Lottridge has taken the agency for the State of Georgia for U. S. trucks. He was formerly general manager for Cuyler Lee, San Francisco, Cal., Packard distributor.

F. A. Hinchcliffe has taken over the Kisselkar line of cars and trucks for New England. Mr. Hinchcliffe is treasurer of the Boston Automobile Dealers Assn.

Cyrille Lacroix, Acason representative in Europe, has arrived safe in Paris after returning from a visit to the United States. He is now stationed at Bordeaux, France, supervising the unloading of several shipments of Acason trucks.

A. A. Bravin, formerly with Pluym & Ochs, Ltd., exporters and importers, has severed connections with that organization.

R. T. Jollie, Jr., has been appointed supervisor of the Ajax Rubber Co. in Ohio, West Virginia and Kentucky.

A. T. Severs, assistant manager at the Minneapolis branch of the Firestone company, has been appointed manager of the branch at Fargo, N. D., succeeding W. R. McCarthy, who goes to the Rubber Products Co., Minneapolis.

Charles R. Porter, for a number of years identified with the motor truck trade in St. Louis, has been made sales manager for the Globe Motor Truck Co., East St. Louis, Ill.

L. A. Bachman has been appointed assistant purchasing agent of the J. C. Wilson Co. He was formerly city buyer for the Chalmers Motor Co.

E. B. Osborn has been elected assistant treasurer of the Selden Truck Sales Co., Rochester, N. Y., assuming some of the duties held by G. C. Gordon, who has been president and treasurer of the company since its organization. The sales of the company for May increased 261 per cent over the corresponding period of last year.

R. E. Updegraff has been appointed chief engineer in the transformer department of the Packard Electric Co., Warren, Ohio. He has been associated with the B. Rutherford Co., Pittsburgh, Pa., consulting engineers, and retains a half interest in that organization.

E. B. Osborn has been elected assistant treasurer of the Selden Truck Sales Co., Rochester, N. Y.

T. H. Smith, one of the field representatives of the Packard Motor Car Co., Detroit, has been detailed to serve as special representative for the Packard company of New York. Mr. Smith will devote his attention to truck business among the national and metropolitan concerns operating fleets of motor trucks. His headquarters are at the Packard New York establishment. Mr. Smith joined the Packard factory forces 2 years ago as a research man on trucks in the advertising department. He was soon taken over by the truck sales organization and made special representative. He is a Virginian, a graduate of Richmond College, and former associate editor of *Power Wagon*, later sales manager for the Mercury Mfg. Co., of Chicago.

W. A. Johnson has become office manager of the automobile tire department of the B. F. Goodrich Co., Akron. He was assistant to A. J. Wills, whom he succeeds. Mr. Wills retired to take up special duties and will be associated with H. C. Miller, director of tire sales. Mr. Johnson was at one time general sales and advertising manager of the Pierce Cycle Co., Buffalo.

Joseph Ward, branch manager of the United States Tire Co. at Indianapolis, has been appointed district manager, with headquarters in the same city.

A. E. Patterson, former salesman in the Portland, Ore., branch of the Goodyear Tire & Rubber Co., Akron, Ohio, is now manager at Tacoma, Wash.

George Bellis has advanced from the position of manager at the branch of the Goodyear Tire & Rubber Co., Akron, Ohio, at Sacramento, Cal., to manager at Los Angeles, succeeding Lingenfelder.

C. B. Peschmann, who has been in charge of the Goodyear sales school at Akron, becomes manager of the Boston branch.

Edward Lingenfelder, for a number of years manager of the Los Angeles branch of the Goodyear Tire & Rubber Co., Akron, Ohio, and one of the most widely-known tire men on the Pacific Coast, has resigned to go into business for himself as a tire dealer.

C. B. Reynolds, formerly manager of the Tacoma, Wash., branch of the Goodyear Tire & Rubber Co., Akron, Ohio, is now manager at Sacramento.

Forrest Arnold, sales manager of the Los Angeles Pacific Kisselkar branch, has been transferred in the same capacity to the San Francisco branch. S. S. Nerney and his brother Ham Nerney have been put in charge jointly at Los Angeles. Richard Dawson has been made manager of the San Diego branch.

B. S. Waterman, formerly branch manager at Boston, Mass., of the Goodyear Tire & Rubber Co., Akron, Ohio, has been placed in charge of the solicitation of manufacturers' business in all departments for the New England district.



We used to know when it was spring by the outbursts of the village poet in the local newspapers. Just as surely as the horse, however, he is being supplanted by the motor truck, at least in Akron, Ohio. When the band of the Republic Motor Truck Co. visited Akron, three rubber companies agreed to decorate three trucks each and hold a parade. The float pictured above was a prize winner

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WHITE TRUCKS

MANY White Trucks have been in service continuously since 1910—and have mileage records well above the hundred thousand mark. These examples of the permanency of White construction are the foundations of White Leadership in the Motor Truck Industry.

THE WHITE COMPANY

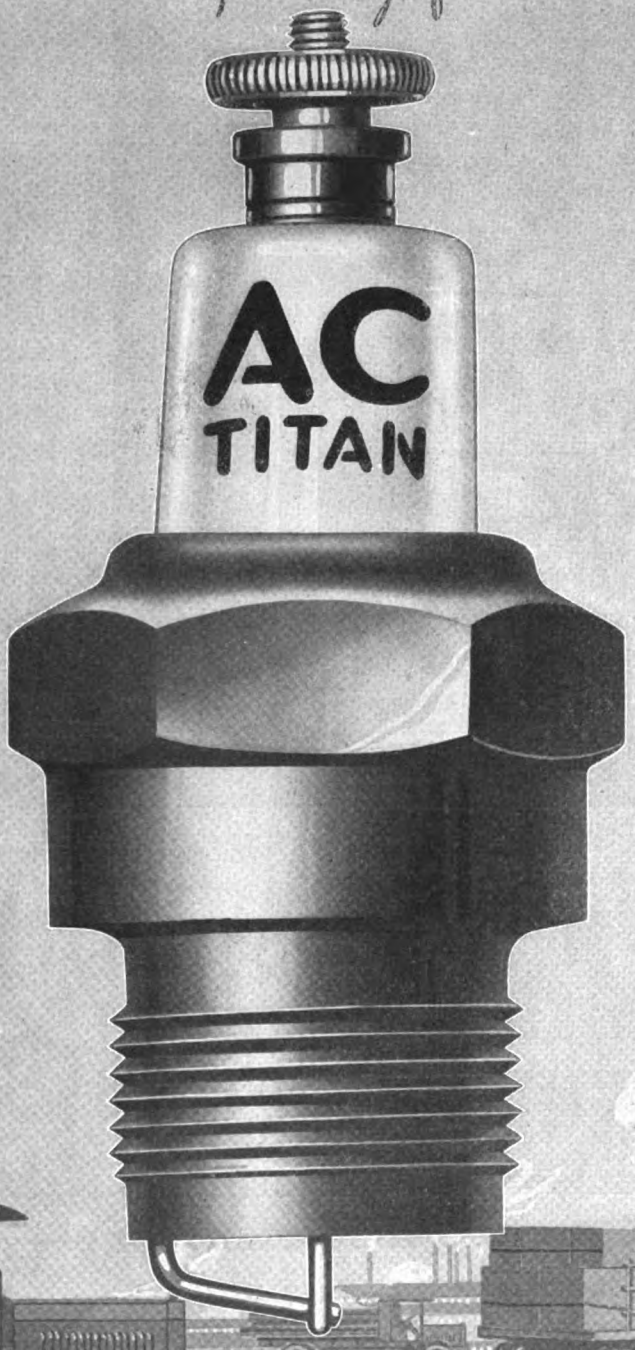
CLEVELAND

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AC

The Standard Spark Plug of America

under the hood of the best trucks



IN peace or war, fast or slow, through mud or sand. On hundreds of thousands of trucks and passenger cars AC Plugs are giving the spark power.

These manufacturers take no chances. They selected AC Plugs on test.

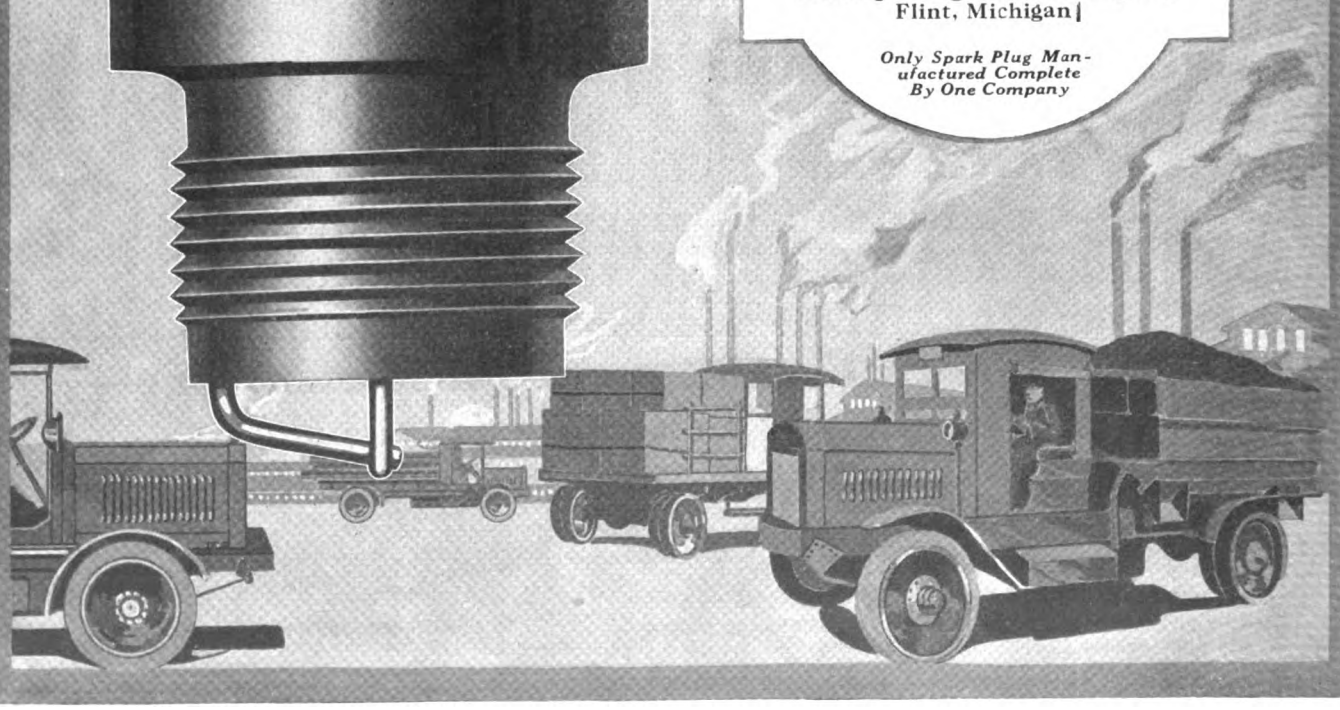
All Trucks Listed Below Are AC Equipped

Federal	Gramm-Bernstein
Kissell	Menominee
G. M. C.	Gabriel
Riker	M. H. C.
Packard	Sandow
Reo	Old Reliable
Wisconsin	Pierce-Arrow
Netco	Diamond T
F-W-D	Brockway
Maxim	Henderson Bros.
Peerless	Republic
Sterling	Wilcox-Trux
Stewart	Moreland
Jeffery	Signal
Acme	American-LaFrance
	Hatfield

DEALERS—Owners of these cars make your demand. Trucks not in this list will show greater efficiency AC equipped.

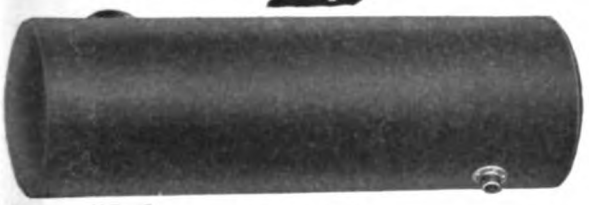
Champion Ignition Company
Flint, Michigan

Only Spark Plug Manufactured Complete By One Company



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GASOLINE TANKS
MADE TO YOUR SPECIFICATIONS



Steel Welded Tank



Terne Plate Built-Up Tank

Welded or lock-seamed, all types and sizes, furnished in any quantity and prompt delivery assured.

Our special tank department, equipped with modern machines, manned by highly-skilled workmen, offers exceptional facilities for serving you.

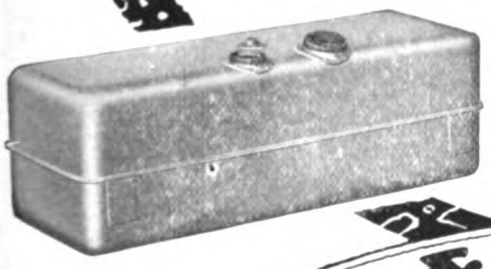
G.P.&F. SERVICE
"KNOWING HOW SINCE '81"

not only gives you the advantage of this specialization, but in addition the benefits of the experience of our large organization, with 36 years to our credit in the manufacture of pressed steel parts.

Many automobile manufacturers are profiting through G. P. & F. specialized service in furnishing gasoline tanks. Let us show you what this service can mean to you.

Send us blue-print or sample for estimate.

GEUDER, PAESCHKE & FREY CO., 1423-1700 St. Paul Ave. MILWAUKEE, WIS.



Drawn Steel Lock-Seamed Gas Tank

Drawn Steel Lock-Seamed Gas Tank

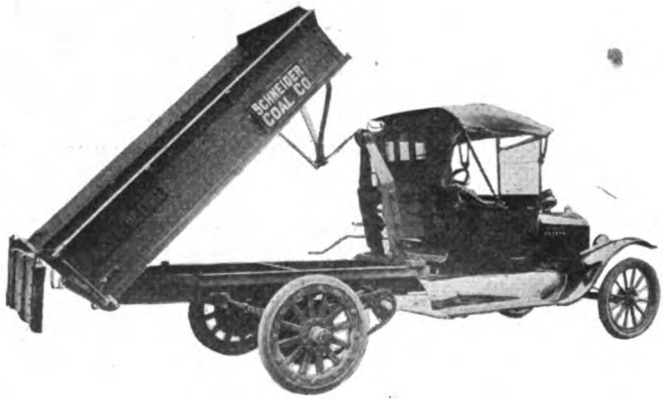


G.P.&F. SERVICE



"KNOWING HOW SINCE '81"

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You Can Do Big Things

with your Truck if it is equipped with the

"Easydump" Body

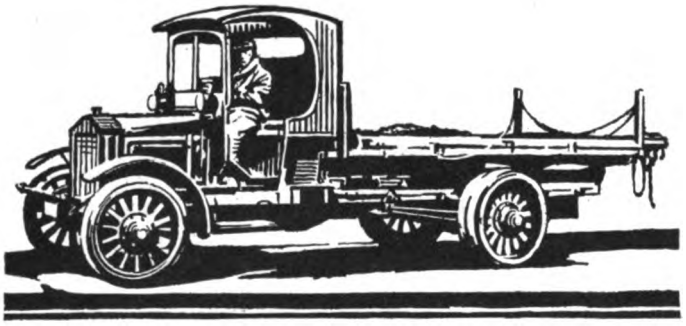
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Made in two different types for side and rear dumping. Adapted to any make or size of truck—1 to 5 tons capacity. Write for particulars.

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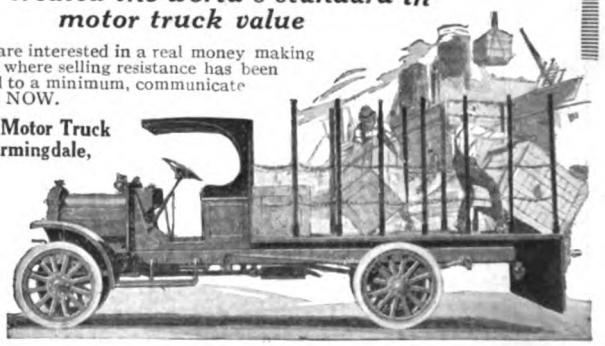
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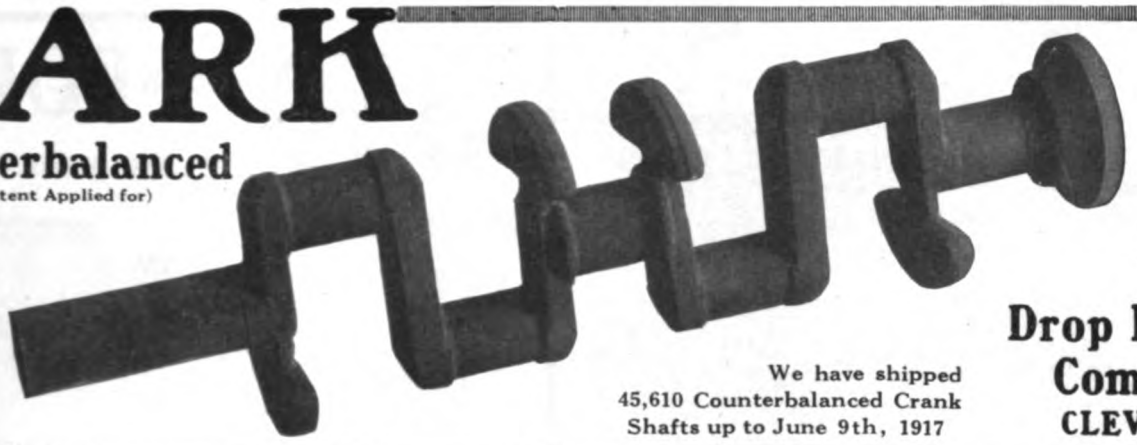
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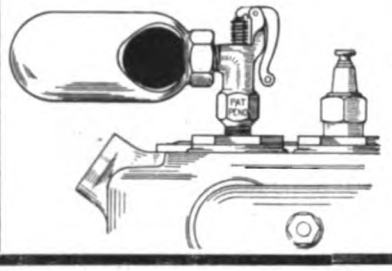
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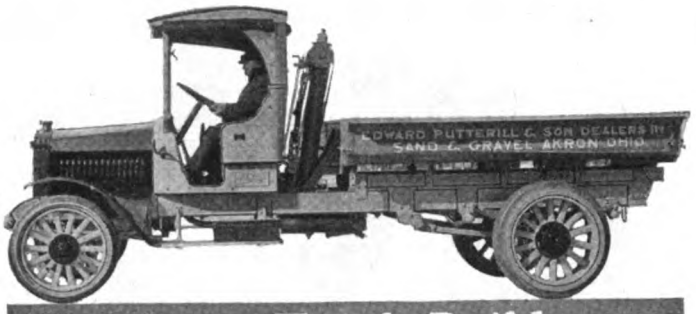


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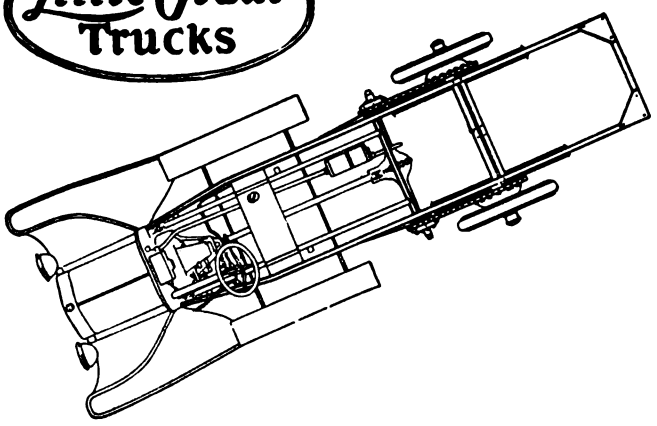
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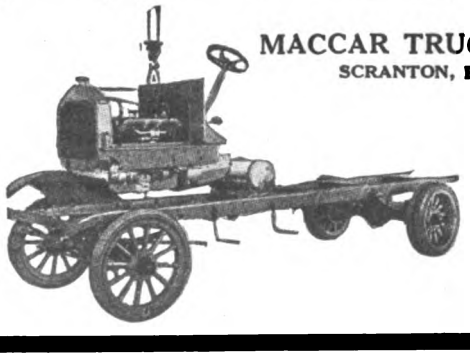
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The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.

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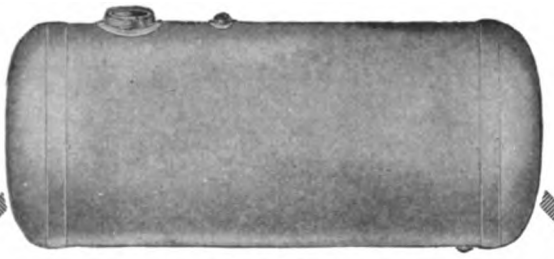
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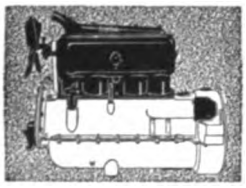
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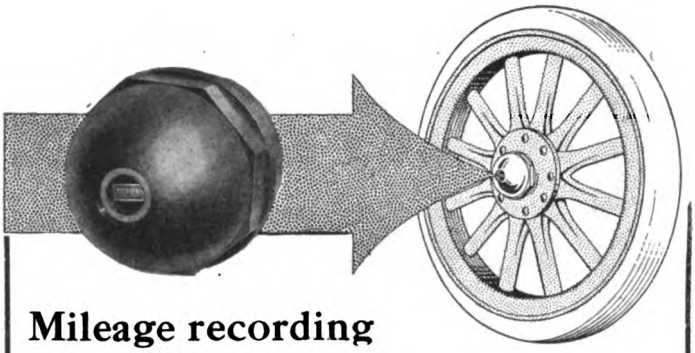
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Know your truck mileage and you can check operating costs for tires, gasoline, oil and repairs. You can tell which tires to buy, who your efficient drivers are and when repairs are excessive. You also save mileage by compelling attention to routing.

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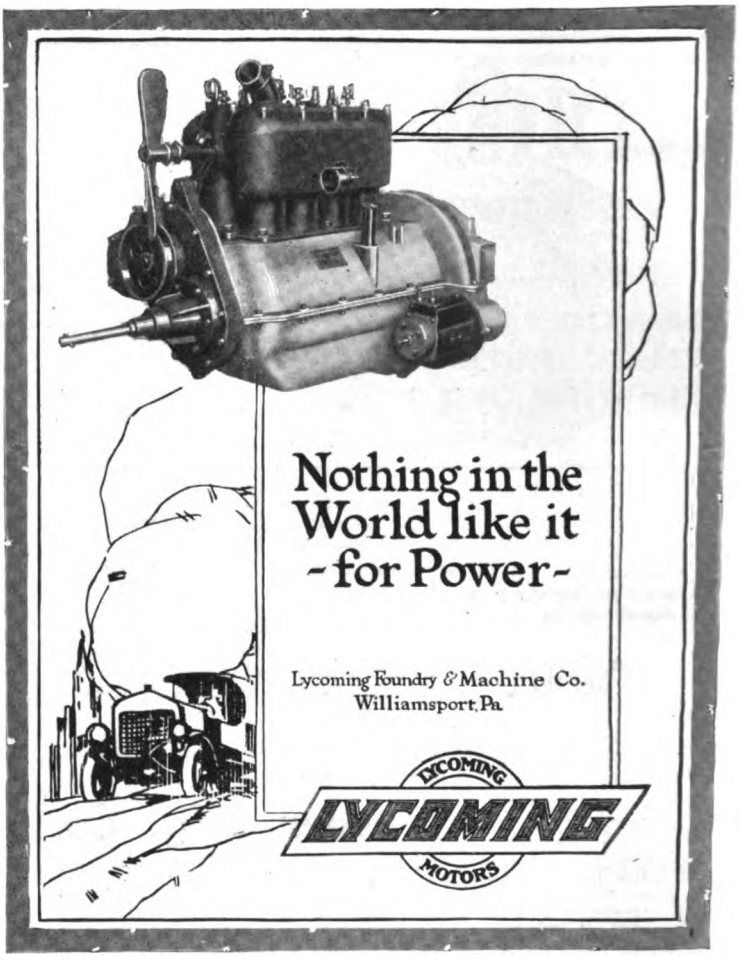
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DETROIT USA

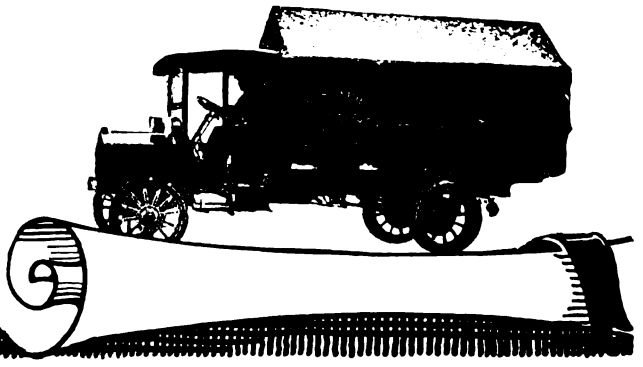
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TRANSMISSION CHAINS



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If you contemplate the use of Silent Chain, don't fail to try the "Whitney."

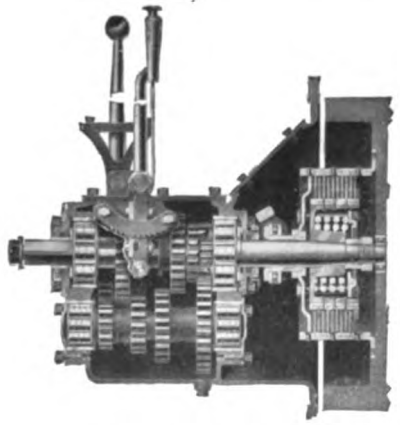
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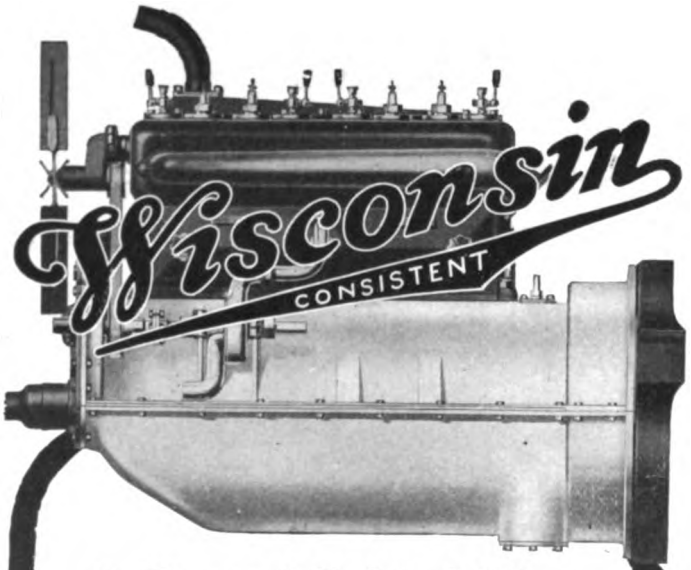
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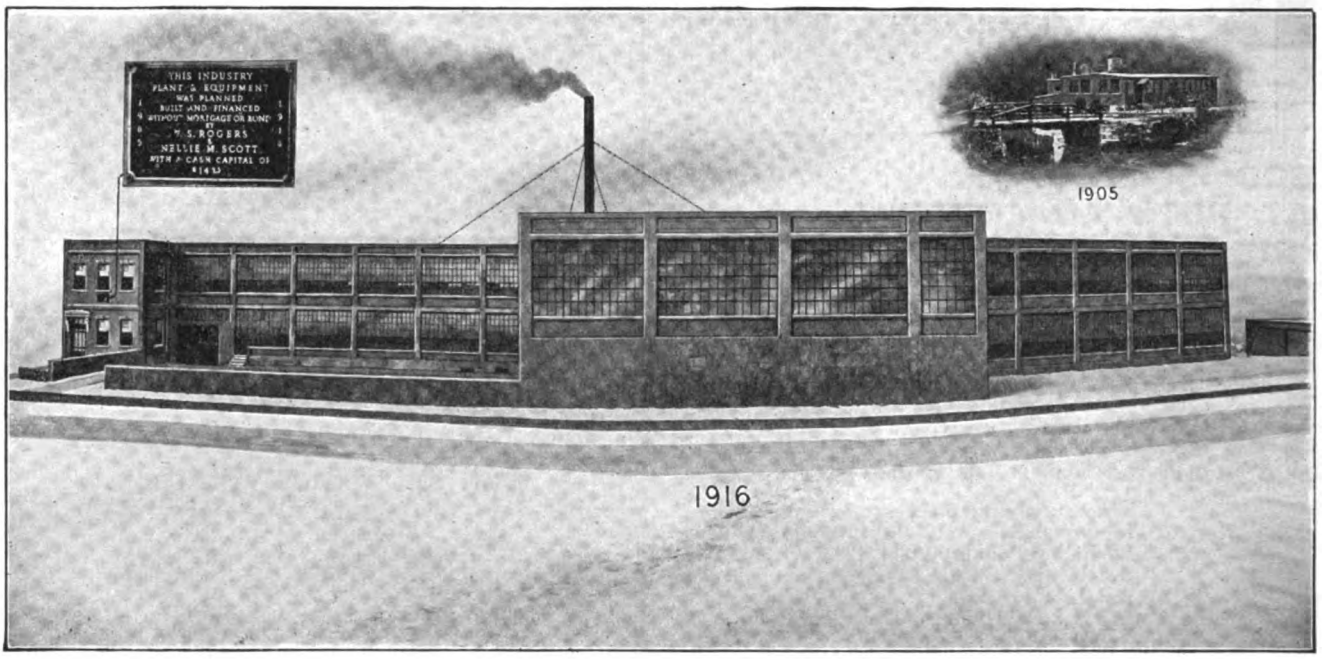
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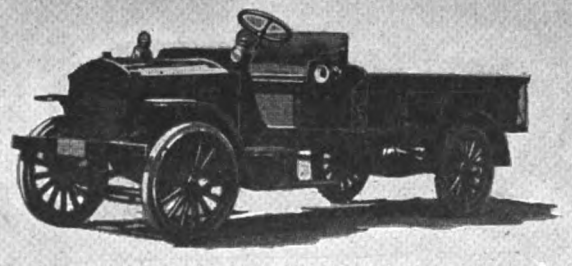
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The GLOBE Truck
The Motor Truck PLUS



Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

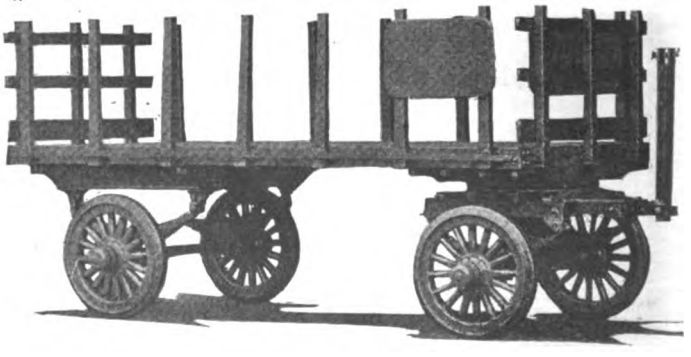
Globe Motor Truck Co.
721 Wright Bldg. St. Louis, Mo.

WATSON TRAILERS and SEMI-TRAILERS

A LINE that takes dealers out of the "weak sister" class of competition and puts them in the front ranks of real money makers. With the Watson line you can meet the requirements of any hauling job, whatever the tonnage may be, whatever type of Trailer or Semi-Trailer may be demanded. And there's the Watson Chassis for any Special Body.

We want dealers who are aggressive enough to desire to represent the foremost line on the market. For them we have a whale of a proposition. Send for particulars TODAY and special literature.

WATSON WAGON COMPANY
(Largest Manufacturers of Bottom Dump Wagons in the World)
28 Center Street, Canastota, N. Y.



PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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THE MARK OF A BETTER RADIATOR

G & O
Radiators
for
Heavy
Duty
Service

The G & O Mfg. Co.
New Haven Connecticut

POLACK
TYRES

"The highest priced tire in America"

It is true that Polack European Profile tires are "the highest priced tires in America", but that is because the quality, safety and **volume of rubber** makes the higher price necessary.



But in **cost per mile** and length of easy riding service, Polacks are cheapest.

Polack S.A.E. Tires, of the same **quality** but less in **volume** than the European Standard, may be had at competitive prices.

But if you desire tires, the quality of which is in perfect keeping with your high grade trucks, specify Polack European Standard (high profile) tires.

POLACK TYRE & RUBBER CO.
1876 BROADWAY NEW YORK CITY
Branches and Service Stations in principal cities

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DENBY
TRUCKS
FOR TRAIL OR PAVEMENT

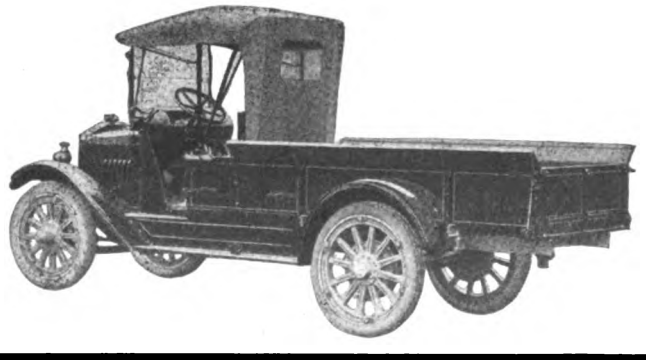
THE remarkably successful development of the internal-gear drive in Denby trucks has done perhaps more to revolutionize truck design than any other single factor.

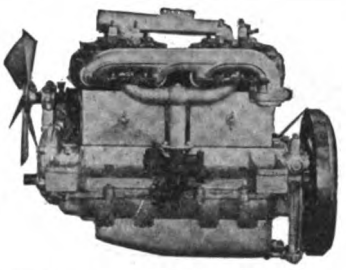
But equally vital to the purchaser, equally important to the dealer, is the *thoroughness* of their construction. The smallest bolt or nut has the same great factor of safety for its work as the frame or axle. Therefore, the performance of the truck is never neutralized by the failure of a so-called minor part.

Denby trucks are *repeaters*. The Denby dealer finds a volunteer salesman in every owner. Steady increase in sales makes necessary steady increase in manufacturing facilities.

A strong company—a truck that's right—a good dealer. There are the three essentials of a profitable business. We have the first two for your territory.

Denby Motor Truck Company
Dept. K, Detroit, Michigan





Beaver Motors Make Their Way By The Way They Are Made

BEAVER MOTORS are made by truck motor specialists. The concentrated experience of engineers of international reputation is embodied in their construction.

BEAVER TRUCK MOTORS are made by men who make nothing but motors—who, by doing the same thing over and over have become masters in perfection. That is why we can make truck motors better, quicker, and at less cost than the truck manufacturer himself.

We make truck motors of all sizes, for all requirements. No matter whether you are building a 1,500 pound light delivery wagon or a 5-ton truck, we can meet your demands for power, economy and dependability.

Do not determine on a motor for your truck till you have sent us your specifications.

BEAVER MFG. COMPANY
Milwaukee Wisconsin

STEGEMAN 6 SIX CYLINDER TRUCKS

THE MASTER TRUCK



In the Stegeman Six-Cylinder Auto Truck

the dead load does not bear on any part of the driving mechanism. The continuous, overlapping power from the Six Cylinder Motor flows in a smooth, undiminished stream to the driving wheel.

Sizes—2, 3, 4, 5 and 7 ton

Electric starter and lights included in standard equipment.

Features

Continental 6-cyl. Motor. David Brown full floating Worm Drive Rear Axle. Brown Lipe Transmission and Multiple Dry Disc Clutch. Westinghouse Electric Self-Starter, Generator and Bosch Magneto. Write for Agency Proposition.

Stegeman Motor Car Co. Milwaukee

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A MARK of distinction symbolizing super-quality, strength and endurance in truck tires that are making history.

Buy Indians and insure the utmost returns from your truck tire investment.

INDIAN TIRE & RUBBER CO.

NEW BRUNSWICK NEW JERSEY

BROWN-LIPE

transmissions and differentials represent the maximum from a standpoint of efficiency and durability.

BROWN-LIPE GEAR CO.
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BROWN-LIPE CHAPIN CO.
Differentials Transmissions

NEW YORK—Thos. J. Wetzel, 29 West 42d St.
SAN FRANCISCO—A. H. Coates, 444 Market St.
CHICAGO—K. Franklin Peterson, 122 So. Michigan Ave.
DETROIT—L. D. Bolton, 2215 Dime Savings Bank Bldg.
Foreign Agent, Benjamin Whittaker, 2, Norfolk Street, Strand, London, W. C.



Three in One

THE first ball bearing to do successfully the work of a radial and two thrust bearings — the New Departure "Double Row."

It carries loads from any and all directions, economizes cost, space, time and labor of assembly — and is permanently in correct adjustment.

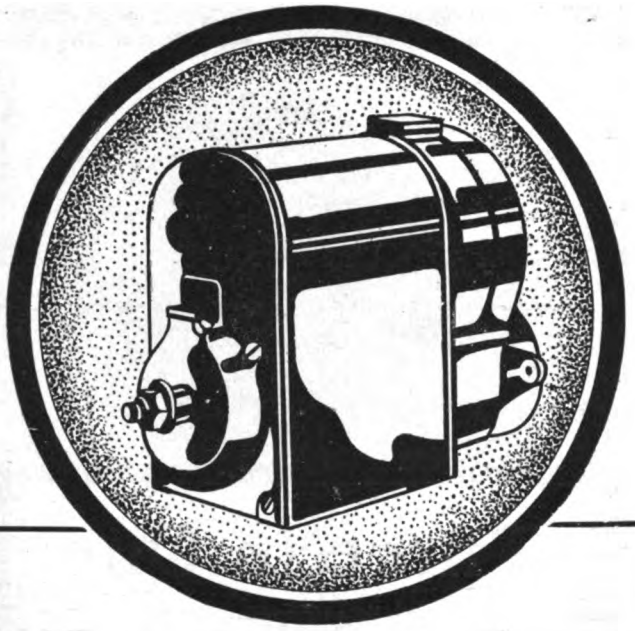
In general use in American motor cars of all types and load ratings.

Have you a copy of the "Brown Book," describing the full New Departure line—double row, single row, and radax ball bearings?

THE NEW DEPARTURE MFG. CO.
Bristol Connecticut

NEW DEPARTURE BALL BEARINGS

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There's One Big Thought Behind the Eisemann

Through sixteen years of consistent progress and improvement—the longest time that has been spent in developing any High Tension Magneto—there has been no change in our original purpose.

To hold the cost of the Magneto within reasonable limits and to excel in compactness and appearance—these are important objects which have received their full share of attention from the Eisemann Engineering Staff.

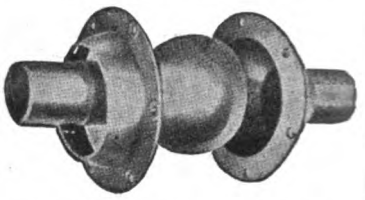
But no one of these considerations has been allowed to interfere with the one dominating Eisemann purpose. Our fixed determination has been to make the **most efficient** Magneto.

And so we are making it. For proof, consult the long list of truck, car and tractor makers who use Eisemann as standard equipment.

THE EISEMANN MAGNETO CO.
Sales and General Offices:
32-33rd St., Brooklyn, N. Y.
Chicago, Ill., 910 So. Michigan Avenue
Detroit, Mich., 802 Woodward Avenue

THE
EISEMANN
MAGNETO

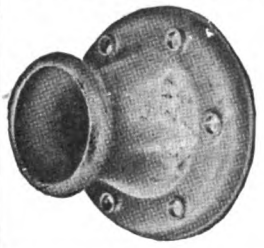
BOSSERT



In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice. We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, axle housings, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.

"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications.



THE BOSSERT CORPORATION
UTICA, N. Y.

EXCESSIVE SPEED—
the surest route to
EXCESSIVE COSTS

The effects of excessive speeding is indelibly written on the books of every motor truck owner. It shows up in the form of added gasoline consumption, low tire mileage, high repair costs, excessive upkeep cost, interrupted truck service and shortened life of the entire truck.

MONARCH
Limits the Speed and the Expense
GOVERNOR

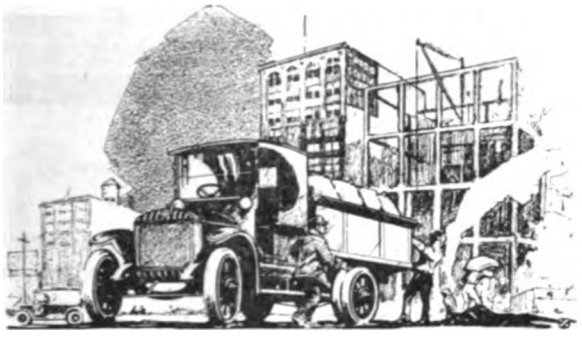
The Monarch Governor stops all this waste—it governs the speed of the motor both when the vehicle is in motion and standing. Designed solely for internal combustion engines it shows greatest efficiency. A thirty-day trial by your testers will convince you as it has a score of other leading truck manufacturers.

MONARCH GOVERNOR CO.
520 Bethune Ave., West, Detroit, Mich.



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DIAMOND "T"



A Truck That Has PROVED Its Merit

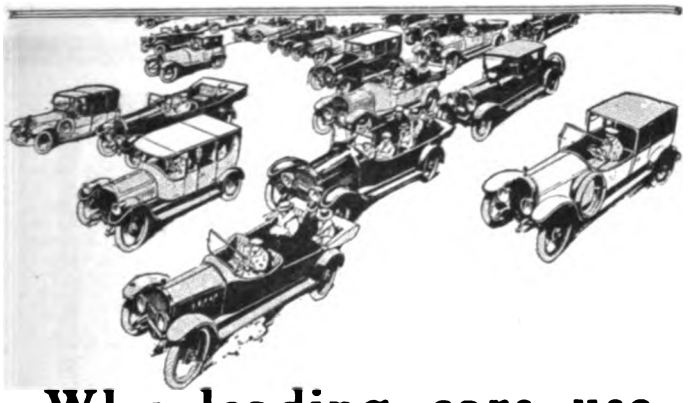
Under the severest tests, with the hardest usage, even abuse, Diamond T Trucks have demonstrated beyond question their high quality construction, their absolute dependability and matchless fuel economy.

Ask any Diamond T user, for Diamond T rests its case with them. Write us today for complete information.

DIAMOND T MOTOR CAR COMPANY
Chicago, Ill.

5 MODELS
All Worm Driven

1 Ton, 1½ Ton, 2 Ton,
3½ Ton, 5 Ton Capacity



Why leading cars use Thermoid Brake Lining

Realizing the importance of good brake lining, leading car and axle manufacturers select for their cars and axles the brake lining that won't grab or slip—Thermoid Brake Lining.

Some of the cars that use Thermoid Brake Lining are:
Pierce-Arrow, Peerless, Marmon, Haynes, Studebaker, Kissel, Apperson, Premier, Chalmers, White, Auburn, Service Truck, Metz, Autocar, Briscoe, Pathfinder, Hudson, Cadillac, Cole, Lexington-Howard, Rauch & Lang, Atlas Truck, King, Stephens, Patterson, Superior Truck, Davis, Kline Kar, National, Hesemer Truck, Sayers & Scovill, Pilot, Sun, Empire, Moon, Ames, Gersix Truck, Republic Truck, Fulton Truck, Columbia Truck, Denby Truck, Bethlehem Truck, Union Truck, Hudford Unit, Denmo Truck, Lippard-Stewart Truck, Moreland Truck.

Specify Thermoid

When you reline your brakes, specify the brake lining the experts specify—Thermoid. Jobbers, garages and dealers will be glad to supply you.

THERMOID RUBBER COMPANY
Factory and Main Offices: Trenton, N. J.
Branches: New York Chicago San Francisco Indianapolis Detroit Los Angeles Philadelphia Pittsburgh Boston London Paris

Thermoid
HYDRAULIC COMPRESSED
100% BRAKE LINING

Makers of "Thermoid Tires" and "Thermoid Garden Hose"



Type S.
55

CONFORMING TO
U. S. GOVERNMENT
SPECIFICATIONS
DATED APR. 12th, '17

GRAY & DAVIS
TRUCK
SEARCHLIGHT

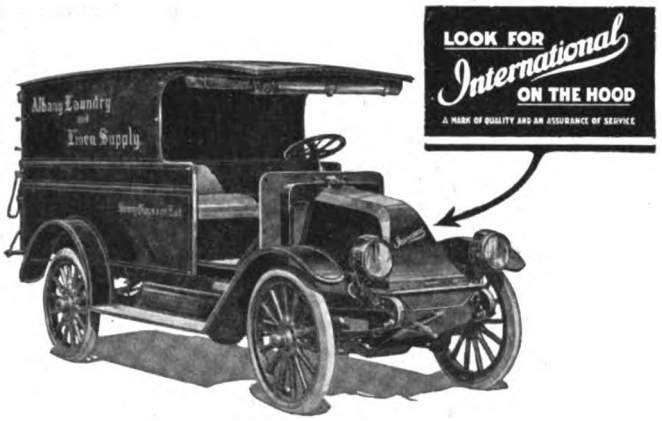
A strong, sturdy searchlight for trucks. Built in ***exact accordance*** with U. S. Army specifications, which ***insure*** highest quality of material, 100% efficiency and long service under most trying conditions. Conveniently operated from driver's seat.

This searchlight is considered a real necessity by truck owners who realize the utility and safety of ***proper*** illumination at night.

Write for particulars

GRAY & DAVIS, Inc.
Boston, Mass.

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A Truck and Name that Means Much in Traffic and Transportat on

INTERNATIONALS are bearing a surprisingly large part of the nation's burdens in this trying period when it is the duty of every factor in American commerce to render the best service without waste or delay.

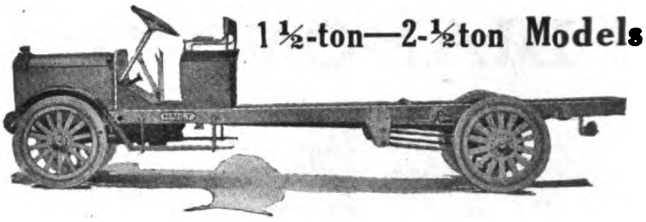
Internationals are in dependable action in every line of industry, in every corner of the country. They are conveying food supplies for Armour & Company; delivering goods for the largest department stores; extending the trade of the nation in the service of the American Express, the Northern Express, and Wells Fargo; uniting the trade of the nation in the service of Standard Oil and Gulf Refining, Western Electric and American Telephone & Telegraph, and Bell Telephone.

International Motor Trucks are proving themselves a crowning product of a 75-year-old manufacturing and service organization that has never been interested in any but the very highest ideals in machine building.

Eighty-nine International branches in principal cities are rendering attention of the kind that motor truck owners want and appreciate. Here are on display the late models, of 1500 and 2000-lb. capacities, attractive trucks at moderate prices, with long life built into them from the frame and engine to final detail. Write the address below for catalogues and any other information regarding **International Motor Trucks.**

International Harvester Company of America (Incorporated)

88 Harvester Building Chicago, U. S. A.



1½-ton—2-½ton Models

America's New Quality Truck Has 20 Remarkable Features—

features proven in the fire-test of actual service to be of money-saving merit to users and sales creative value to dealers. These set MANLY Trucks in a class far up among quality commercial vehicles.

MANLY

TRUCKS

Wire or write for advance information or visit our factory. Handsomely illustrated catalog sent on postal request.

Territorial arrangements now being made for early deliveries

MANLY MOTOR CORPORATION

WAUKEGAN ILLINOIS

Clydesdale

COMMERCIAL CHASSIS

DEPENDABLE COMMERCIAL VEHICLES

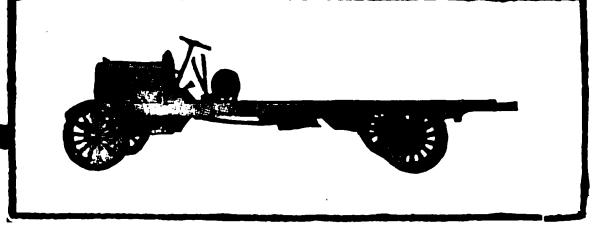
— A Complete Line—

¾ TO 5 TONS

Clydesdale Trucks equipped with Krebs Automatic Controller assures prolonged service at minimum cost.

There is a type and capacity to meet every haulage requirement.

THE CLYDE CARS CO.
CLYDE, OHIO



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The "Baby Wood"



Hydraulic Hoist—
TYPE "E"

just as good a servant for the small dump truck,

as Father Type "D" Heavy Duty is for the Big Dump Truck, and Mother Type "C" was for the middle-size Dump Truck.

* * * *

—the lightest,
—the simplest,
—the most positive,
—the quickest-working and most easily installed Dumping Device made.

Made to fit any chassis.

Sole Manufacturers

Wood Hydraulic Hoist & Body Co.
New York DETROIT Chicago

NEVER-LEAK
Copper Asbestos-Filled
GASKETS

Get our estimate on your next gasket requirements. You will be agreeably surprised.

For producing absolutely gas-tight joints nothing has ever been invented to compare with Never-Leak Gaskets. You can protect yourself from all worries over compression leaks if you fully equip your motor with these Copper Asbestos-Filled Gaskets.

The copper gives malleable metal contact surfaces. The asbestos secures a body which retains a powerful spring under compression.

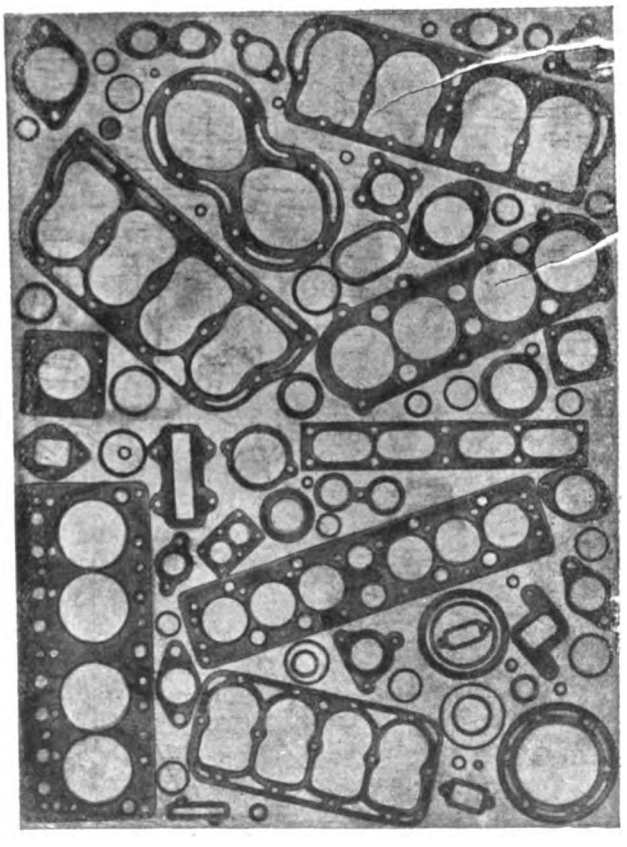
If you have gasket trouble of any nature consult our Engineering Force. This will involve you in no obligation or expense.

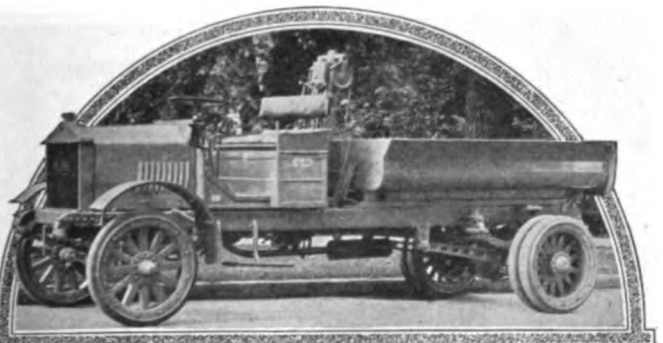
Write for our estimates. We are equipped with many thousand special dies such as here shown and can readily produce the gaskets you need.

Have "Never-Leak" on every gasket.

The Fitzgerald Mfg. Co.
TORRINGTON, CONN.

Gasket Dept.





Selden Trucks

"After a service of 6,000 miles, our Selden Truck is in very excellent condition—showing little or no wear in any way. It has run all this year without a hitch—given us splendid satisfaction," writes the head of a large plumbing supplies business in Western New York.

Under heavy loads, such as are customary in the plumbing supplies business, this Selden Truck has demonstrated again the wearing qualities of Selden "IN-BUILT QUALITY."

DEALERS: Write for territory.

Selden Truck Sales Co.
Rochester, N. Y., U. S. A.

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HB·VENUS·

VENUS 10¢ PENCIL

A MAN with an idea at the tip of his pencil or busy on rush work, simply **can't afford** to use a pencil the lead of which isn't durable and gritless.

VENUS PERFECT PENCILS are **the** pencils for severe requirements. They're smooth, uniform, strong and durable, and the 17 black degrees from 6B softest to 9H hardest provide a pencil for any purpose. The hard and medium VENUS Copying for billing and manifolding are preferred everywhere. **Specify VENUS and look for the distinctive finish!**

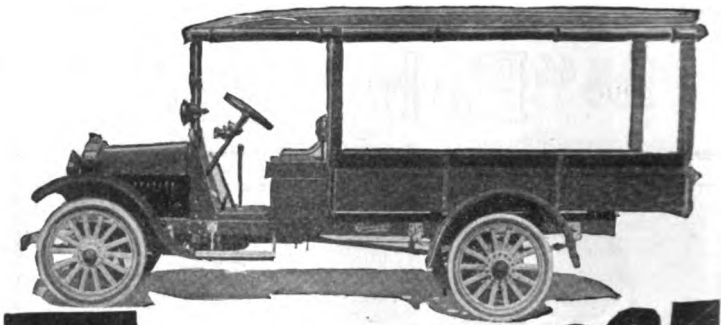
VENUS ERASER *Superfine Quality* *Rubs out Cleanly and Easily*
Will not soil or streak. 12 SIZES, FROM 100 TO BOX. TO 4 TO BOX. BOX PRICE $2.00

FREE:



This test box of five VENUS Drawing Pencils, a metal holder and a VENUS Eraser free. Write for same today!

American Lead Pencil Co.
247 Fifth Avenue, New York
and Clapton, London, Eng.



Commerce
TRUCKS
1 TON CAP

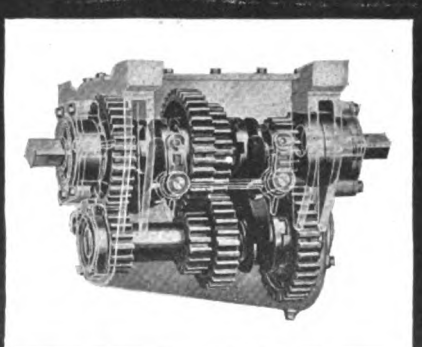
A Year Ahead *of* Other Trucks

The only truck having everything necessary on it—when you buy it

Three types of bodies for all models—Remy Starting and Lighting—Stewart Vacuum System—Pierce Governor—Windshield—Bumper.
Continental Motor—Torbensen Rear Axle—Detroit Steel Products Company Springs. Price—f.o.b. Detroit.

The Commerce Motor Car Company
DETROIT MICHIGAN
W. H. Brinkerhoff, Eastern Dist. Mgr.
Belmont Ave., Elmhurst, Long Island, N. Y.

COTTA TRANSMISSIONS



All Gears Always in Mesh

ROCKFORD

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

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The New Dearborn Universal One-ton Truck Unit for All Cars

A better more profitable money maker for dealers. A truck unit made to fit all cars. Built by a strong, nationally known and successful company.

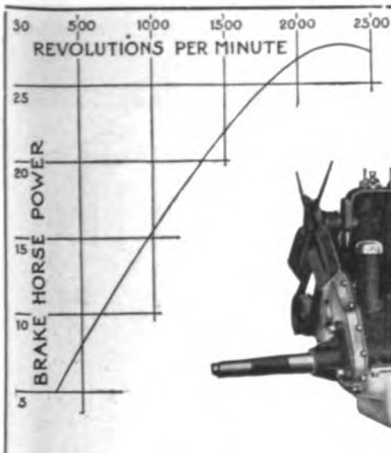
$350 and up — One or Two-Ton DEARBORN Truck Unit — $350 and up

All Dearborn Truck Units are designed so that 90% of the load is carried on their heavy Dearborn Rear Axles, Heavy Springs and Heavy Pruden artillery type Rear Wheels, with guaranteed hickory spokes and felloes.

Bock Heavy Duty Roller Bearings, Baldwin Roller Chains, Baldwin Steel Sprockets, Jack-Shaft Hangers and Back-Rod Hangers HOT riveted to frame—not merely bolted.

Write or wire for Dealer's Big Money Making Proposition.

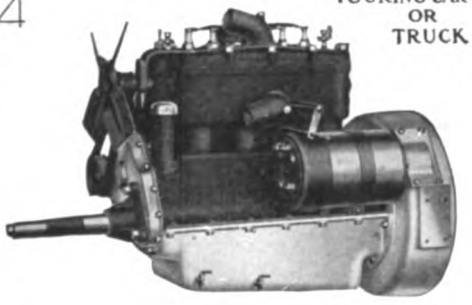
Dearborn Truck Company
1230 S. Campbell Ave., Chicago



LE ROI MOTOR

3⅛×4½ MODEL C

FOR THE LIGHT ROADSTER TOURING CAR OR TRUCK



Used by leading manufacturers of best-known American-made light trucks.

The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information

CABLE LE ROI MILWAUKEE

Heavy Duty Truck Frames

Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

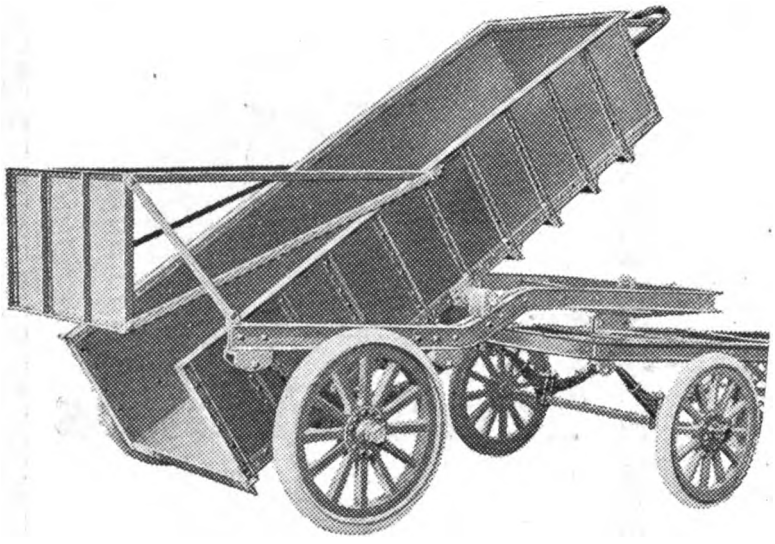
Added capacities together with latest type equipment enables our assuring you of satisfactory service.

Our engineers are at your service, and we solicit your inquiries.

SAVAGE ARMS CORP.

FORMERLY
DRIGGS-SEABURY ORDNANCE COMPANY
SHARON, PA.

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MR. DEALER

You Can Make Big Money If You Sell

Rogers Brothers All-Steel TRAILERS

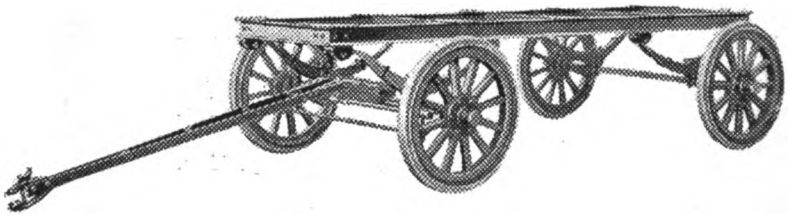
THE MOST EXTENSIVE AND BEST LINE OF TRAILERS MADE TODAY

TWENTY-SEVEN MODELS

Made in Every Type, Size and Capacity ***For Every Purpose***

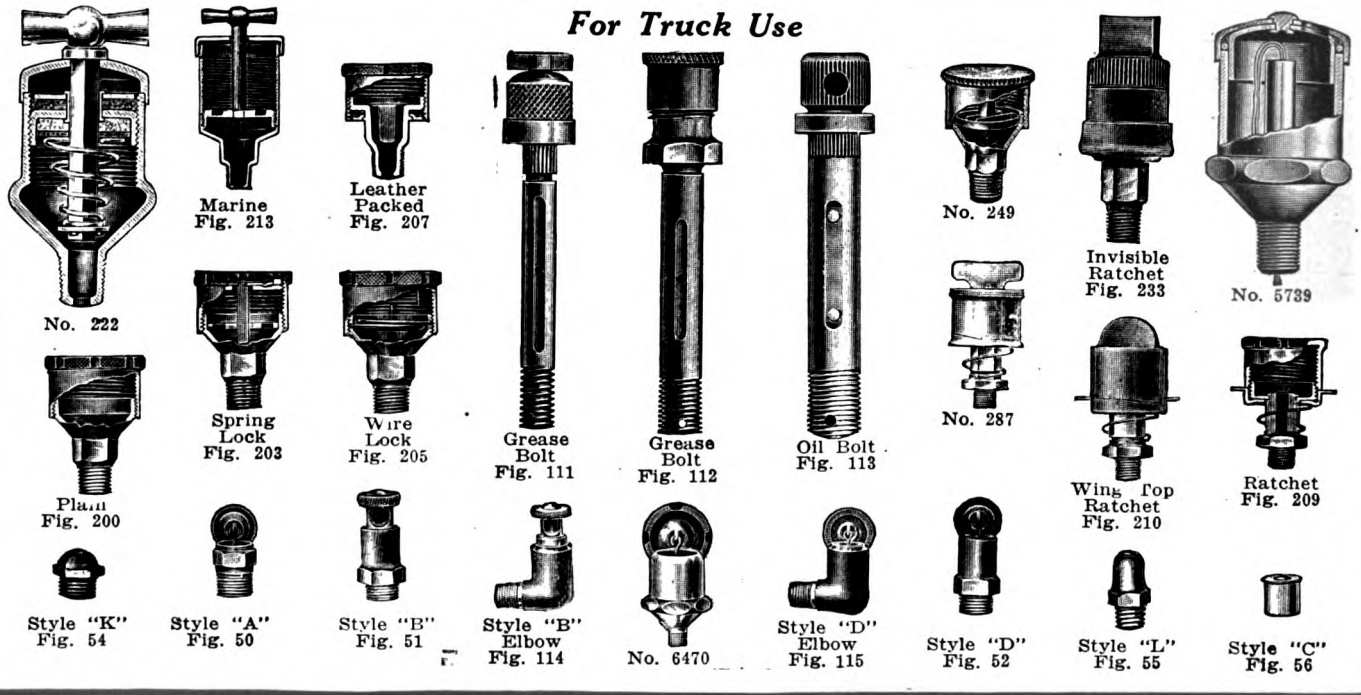
Rogers Brothers Company
Albion, Pa.

ROGERS BROTHERS COMPANY
Of NEW YORK
Eastern Distributors and Exporters
50 EAST 42d STREET NEW YORK



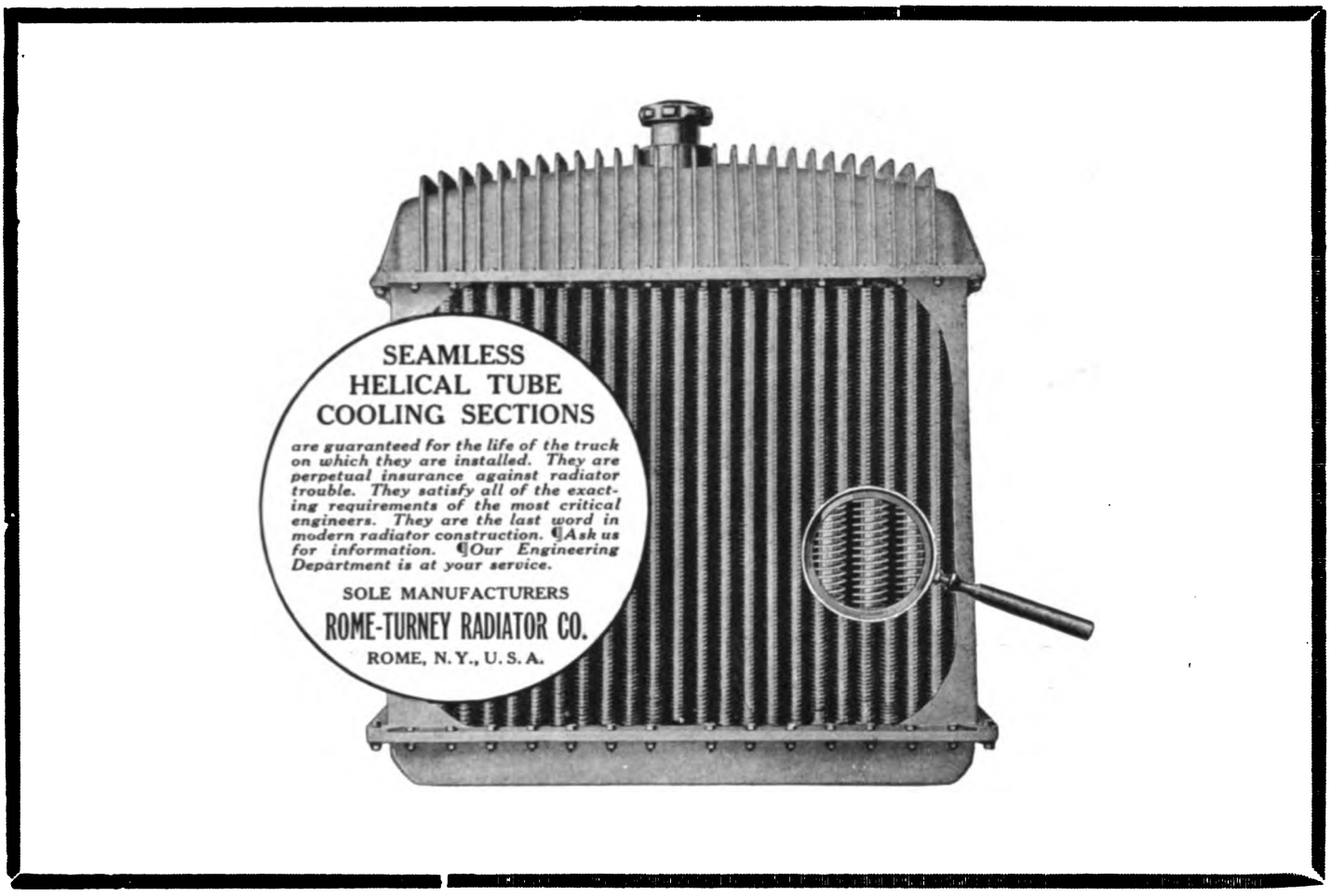
EMPRESS
OIL AND GREASE CUPS

For Truck Use



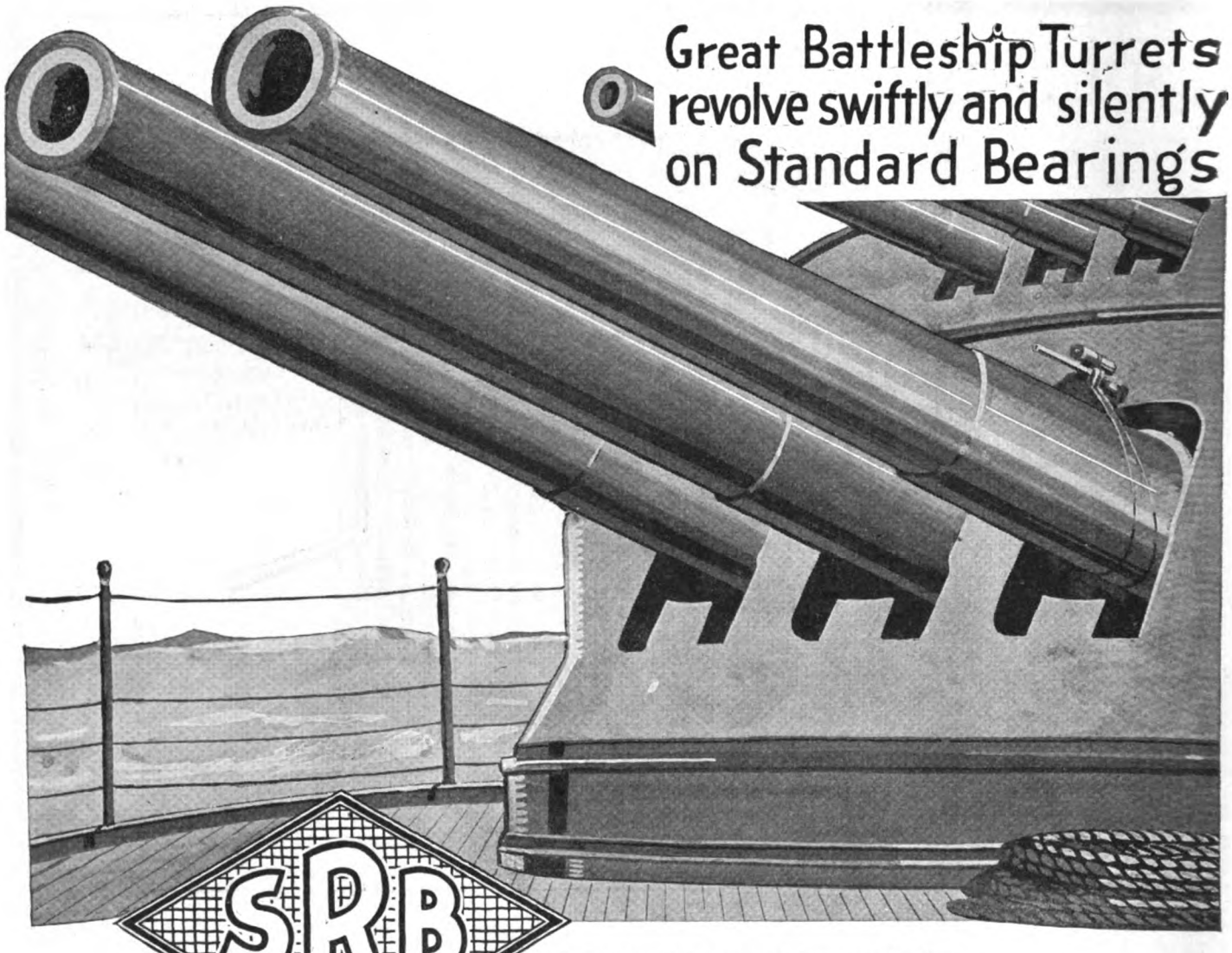
BOWEN MFG. CO.
AUBURN, NEW YORK
SEND FOR CATALOGUE "A"

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Great Battleship Turrets revolve swiftly and silently on Standard Bearings

SRB

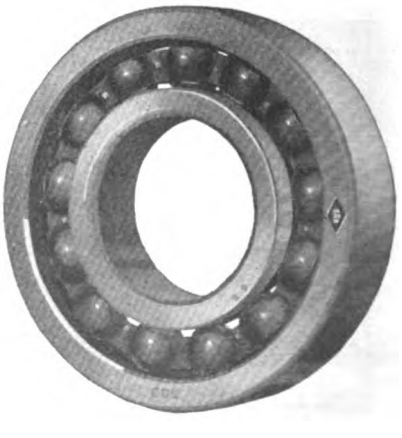
Sturdy Reliable Bearings

MAXIMUM SILENT ANNULAR BALL BEARINGS

The movement of battleship gun turrets is only one of the many exacting purposes for which S R B Bearings are used.

S R B Bearings are designed to meet every requirement, large or small. Let our Engineering Department help you select the type that will give you the greatest efficiency.

Dealers in cities where we have no representative will find our agency proposition very interesting.



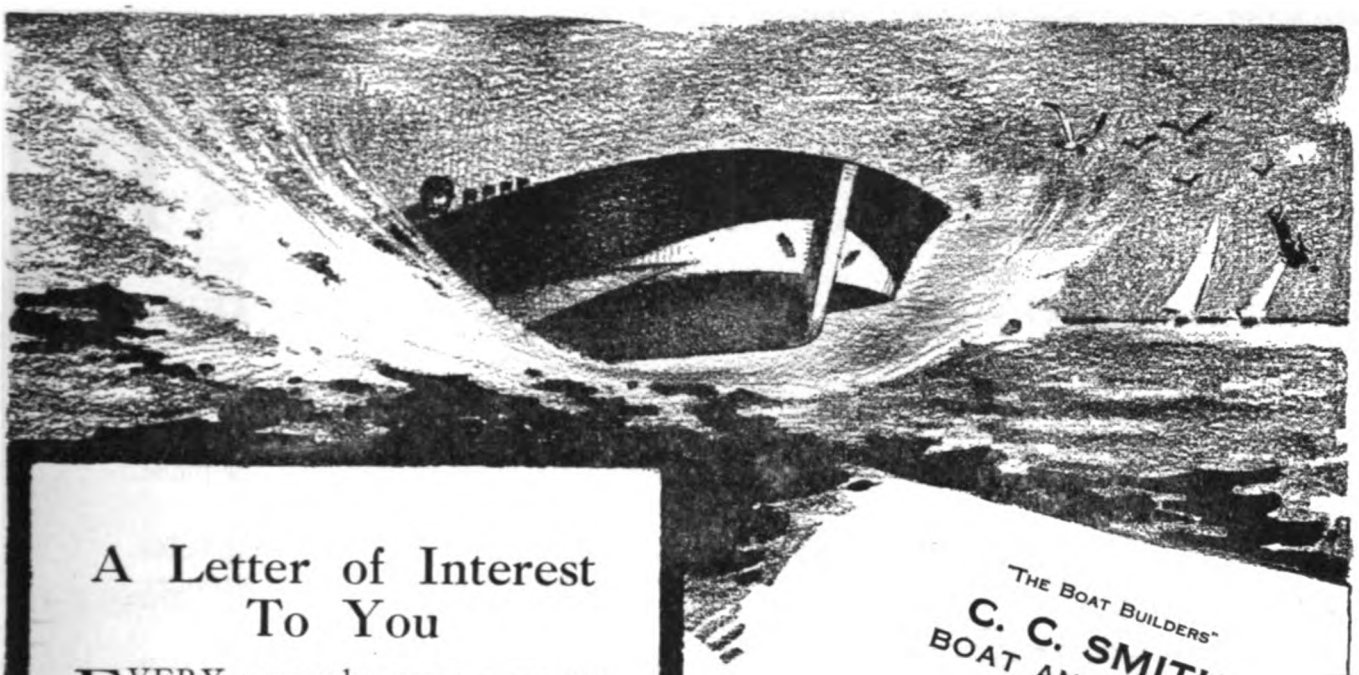
Makers of S R B Annular Ball Bearings, Ball Thrust Bearings, Taper Roller Bearings, Steel Balls and *Rudge-Whitworth* Wire Wheels.

Standard Roller Bearing Co.

PHILADELPHIA, PA., U. S. A.

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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A Letter of Interest To You

EVERY man who owns a car or a motor boat should read this letter from the C. C. Smith Boat and Engine Company, builders of the fastest boat in the world—the Miss Minneapolis, which has a record of 63.57 miles per hour.

Proper lubrication of the high speed motors used in automobiles and in many boats is of paramount importance to the owners. Your experience has probably shown you that such lubrication may not in all cases be easily obtained.

TEXACO MOTOR OIL

in the opinion of experts who have studied the question of lubrication from every angle, does lubricate properly under even the most exacting circumstances.

The selection of this oil by Mr. Smith and his associated engineers should interest you, not essentially because it related to the fastest boat ever built and helped to give her her speed, but because to a certain extent their business prestige was at stake, and because they had at their disposal all brands of motor oil with which they could experiment and from which to make their choice.

Such impartial opinion from men of great experience in their field is worth profiting by. You can't do better than follow their example.

Use Texaco Motor Oil in your automobile or motor boat. The safest way, the best way, to buy it is in one or five gallon cans.

THE TEXAS COMPANY
New York Chicago Houston
DISTRIBUTING OFFICES IN MOST CITIES

THE BOAT BUILDERS
C. C. SMITH
BOAT AND ENGINE COMPANY
C. C. SMITH, PRES.

ALGONAC, MICHIGAN. Aug. 21,

Texas Oil Company,
Chicago, Ill.

Gentlemen:-

Enclosed please find check for ($15.90) to pay for our last shipment of extra heavy TEXACO oil. We herewith want to order for immediate shipment by Adams express 40 gallons in 5 gallon cans of TEXACO #556 extra heavy. We would also say to you that since the races in Peoria in 1914 we have used your TEXACO oil in the Baby Speed Demon, Baby Reliance, Buffalo Inquiry, Miss Detroit and Miss Minneapolis and up to the present time have never had to remove a bearing on account of lubrication or for the inefficiency of the oil. This may be of some value to you as an advertisement.

Please give this order your prompt attention we want this oil to drive next Saturday in the Gold Cup races.

Very truly yours,

C. C. SMITH BOAT & ENGINE CO.

Per

Pres.

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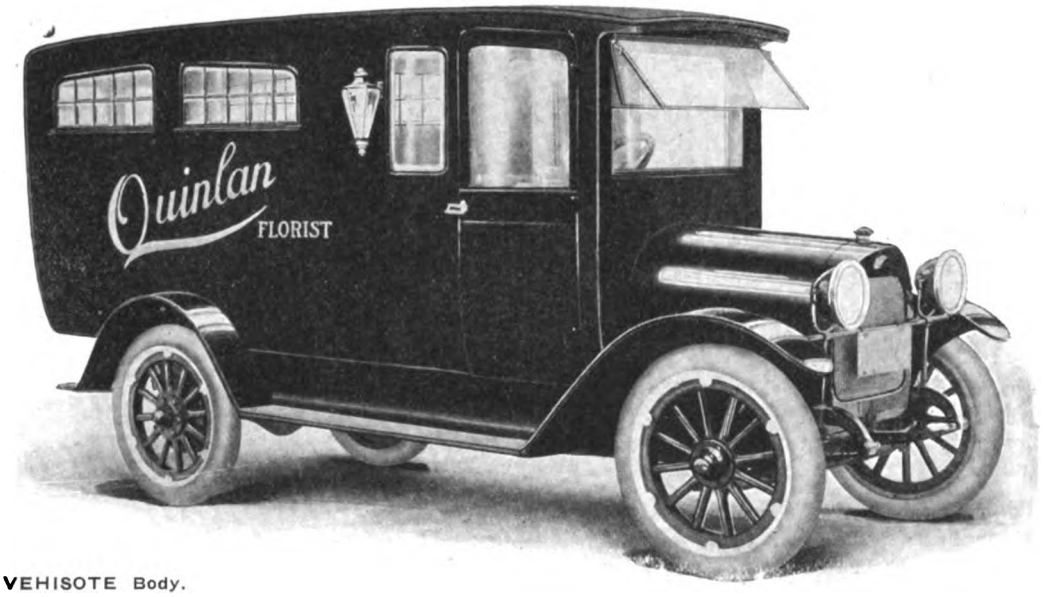
VEHISOTE

Has No Grain No Laminations

Side panels consist of one large sheet of VEHISOTE—crackless—jointless—flowless. The checking and blistering, the gaping seams, which are so unavoidable in wooden panels, are impossible with this impervious, one-piece material.

VEHISOTE is waterproof, impervious to climatic conditions, takes and holds paint equal to wood, can be given a very beautiful finish and grows stronger with age.

VEHISOTE is not a substitute for wood in vehicle body building. It is a scientific and positive improvement over wood or any other material for the purpose.



VEHISOTE Body.
Built by August Schubert Wagon Company, Oneida, N. Y.

THE PANTASOTE COMPANY

11 Broadway, New York **People's Gas Bldg., Chicago**

JOBBERS

Scovel Iron Store Co.
San Francisco, Cal.
Gerhab & Ludlam
Philadelphia, Pa.
C. H. Tiebout & Sons
Brooklyn, N. Y.
Wm. E. Kleine & Co.
New York City
E. C. Kadow & Co.
Chicago, Ill.
W. T. Crane Cge. Hdwe. Co.
Newark, N. J.
Mossman-Yarnelle & Co.
Fort Wayne, Ind.
Sligo Iron Store Co.
St. Louis, Mo.
H. D. Taylor & Co.
Buffalo, N. Y.
N. Langler & Sons
Brooklyn, N. Y.
H. Hett & Sons
New York City
Haury Hardware Co.
Cleveland, Ohio
John C. Hills
Trenton, N. J.
Wm. Stockhoff
Louisville, Ky.

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Gary Trucks in the service of large corporations. Watch July 15th issue of The Commercial Vehicle

JUDGE GARY
Trucks For Yourself

5 Models
All Worm Drive
A Serial

CHAPTER 1

Motor Trucks of different makes may seem equal in quality, skill of manufacture and performance—*At First*. In performance one soon falls behind on account of lacking a most important feature of design or some unit not of the highest standard.

The Buda Motor

of today has not been *designed* in the strict sense of the word. It has been *developed* in accord with the BUDA policy along lines which long experience in practical use has proved the best.

Extremely high mechanical efficiency and accessibility have been developed side by side. Buda records for durability, power and torque are well known. Buda accessibility has been as fully attained.

The BUDA MOTORS bear the closest technical examination.

(To be continued in July 15th issue.)

Note—Buda motors are standard equipment in all models of *Gary* Trucks.

Gary serves the biggest and best known users of motor trucks—and serves them well. Not only are Gary Trucks operated successfully, economically and continuously in the same fleets with old established makes—but in some fleets, *in place of them.*

With this information, and the additional knowledge that Gary—with its new factory—is ready for prompt delivery for domestic service, we ask you to write for free illustrated catalog and detail, so, in fact you can—

Judge Gary Trucks For Yourself

GARY MOTOR TRUCK CO.

Gary, Indiana

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AS CONSTANT AS NIAGARA



The Recognized STANDARD

for

MOTOR CARS
MOTOR TRUCKS
AND TRACTORS

Upon request, we will send our Engineering Experts to help solve your problems.

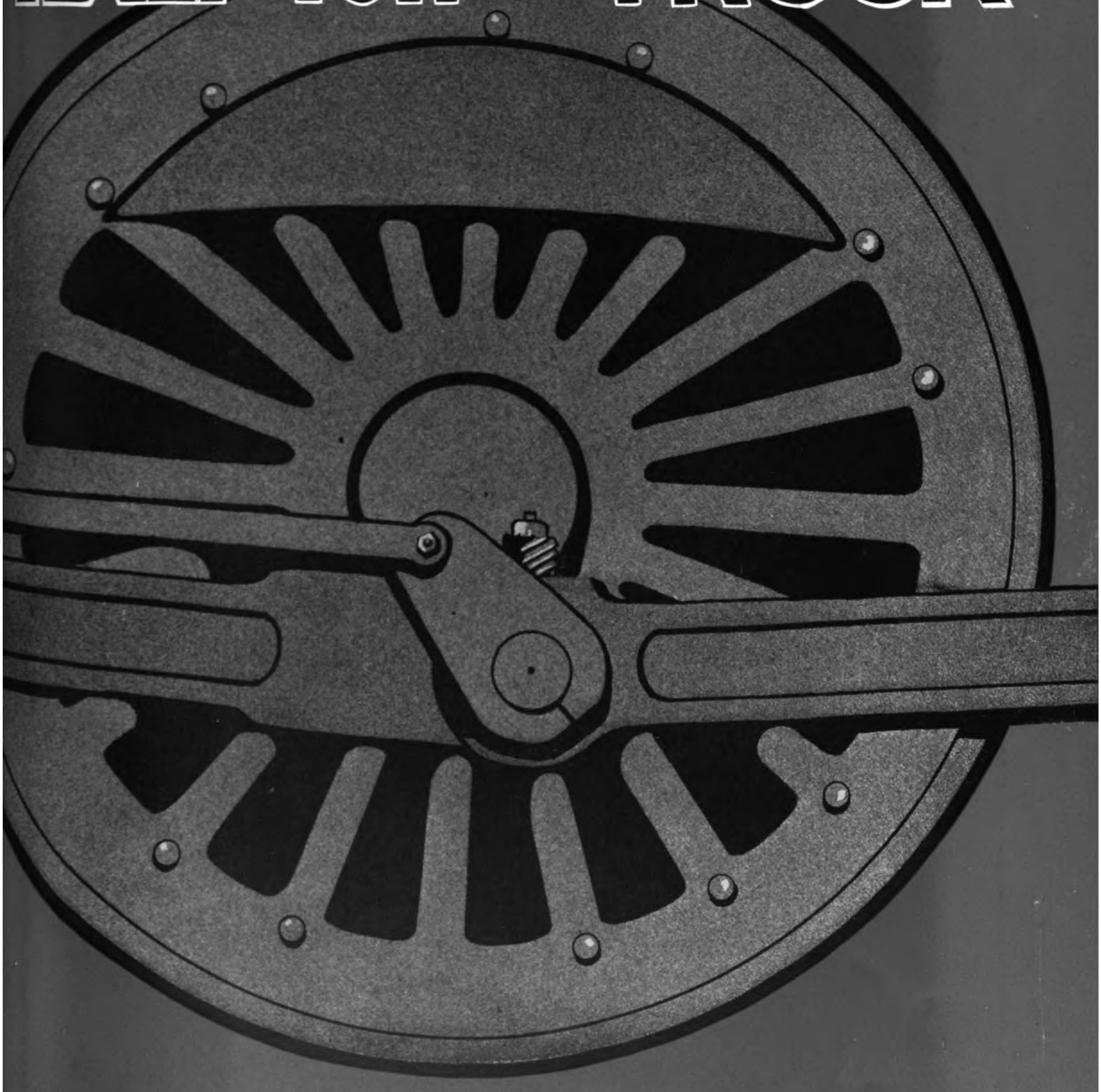
LONG MFG. CO., Detroit, Mich.

Pioneer Makers of Gasoline Engine Cooling Systems

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RUSH

HALF-TON TRUCK



The Only Light Delivery Car with the Counterbalanced Crankshaft Motor.

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RUSH

The Rush Counterbalanced Crankshaft



The Unbalanced Crankshaft



When You Demonstrate

with a Rush you can throttle the motor down to three miles an hour on high in traffic or you can take the worst hill in your town with never a knock or a jerk. You have stupendous power hooked up with silken flexibility. You have prolonged life and marvelous economy in gas and oil consumption.

You can race the Rush motor and stand a pencil upright on the radiator.

These are claims — now for the proof.

You know that vibration, unbalanced power, uncontrolled distortion is the bane of the existence of every automobile engineer.

In the field of high-priced pleasure cars the problem has been partially solved by multi-cylinders — overlapping power impulses. But the expense of more than four cylinders in a light delivery truck is absolutely prohibitive.

Rush engineers have eliminated vibration by the adoption of the counterbalanced crankshaft motor.

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RUSH

CHASSIS
$895

EXPRESS BODY
$965

Next time you pass a railway locomotive take a look at the drive wheel. Opposite the connection between the drive shaft and the wheel itself—on the other side of the hub—you will see a massive weight. If this weight—in perfect balance with the weight of the opposite side of the wheel—were eliminated you can readily see what would happen. With every power impulse the wheel would jerk until the next impulse pulled it over again. The weight absorbs this jerk and by its own momentum applies driving power until the engine provides another pull, through the drive shaft. (See page one of this insert.)

The average pleasure car motor, and all delivery car motors save only the RUSH, are racked by this same jerking every time power is applied to the crankshaft.

Logically, this means distortion—it means a ton of uncontrolled power is loose in the motor tearing and grinding at every moving part.

This vibration is "synthetic" or cumulative, i. e., the jerk comes every fourth or fifth turn of the crankshaft.

The reaction from this jerk resists the motor power. Resistance of every kind must be overcome by using additional fuel—*and gasoline costs real money these days.*

The distortion, the unbalanced power, means friction. The more friction, the more oil consumption. Distortion, vibration, loose power cause wear and tear—*high repair bills.*

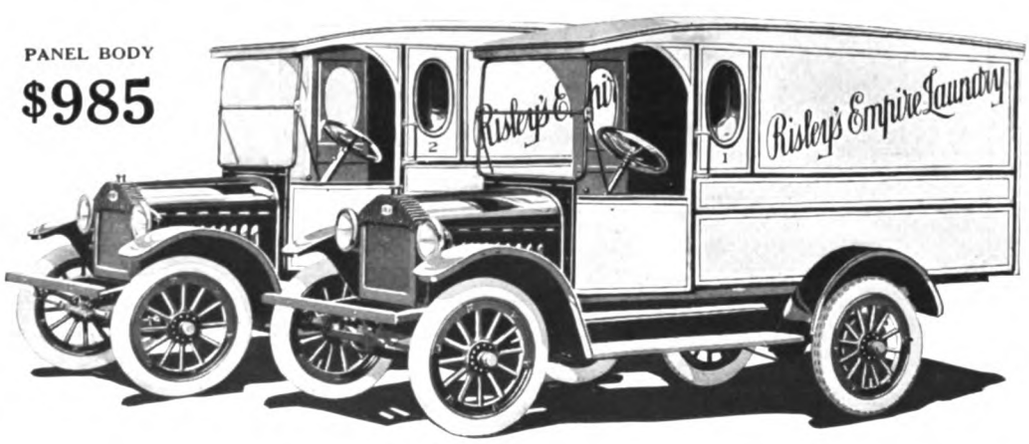
This is a matter of dollars and cents to you because it is the star feature of a list of selling points that are absolutely exclusive to the Rush.

Such a combination of sales material has never before been offered to dealers in a light delivery truck.

Read the specifications on the next page and write for our literature and liberal dealer proposition.

Rush dealers are making fast money everywhere.

PANEL BODY
$985



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RUSH

Specifications

MOTOR: RUSH 3¼-inch bore, 5-inch stroke; developing 29 H. P. at 1600 R.P.M. Four-cylinder monobloc L-head type — three-point suspension — unit power plant, counterbalanced crankshaft.

STARTING AND LIGHTING: SPLITDORF two-unit system, especially designed for delivery car service. Simple — efficient — compact — weather-proof. SPLITDORF ' D'Arsonval" type — 15-0-15 range ammeter, positively indicating generator charge rate and lamp and horn discharge.

IGNITION: CONNECTICUT distributor — WILLARD 6-80 storage battery.

OILING: Automatic constant level pump and splash oiling system.

CARBURETOR: CARTER clear glass float chamber with Carter easy starting dash adjustment.

RADIATOR: Vertical tubular, with expansion tank. Capacity, 5 gallons. Armored, fin-type removable casing.

CLUTCH: BORG & BECK 8-inch dry plate multiple disc clutch. No "stuttering" nor "grabbing."

TRANSMISSION: COVERT, Model "LB" — selective sliding gear type — three speeds forward and one reverse — center control — extra long levers — 40 H.P., special truck design, with oversize gears. All gears high-grade, heat-treated alloy steel. Roller bearings.

UNIVERSAL: 40 H. P. Universal, double-yoke type, with special RUSH strain-relieving ball thrust yoke.

DRIVE: Hotchkiss drive, bevel gear type. Straight line from unit power plant through universal joint.

FRONT AXLE: LIGGETT drop-forged "I"-beam section, with specially designed hubs.

REAR AXLE: Three-quarter floating type — six points of adjustment. BROWN-LIPE differential — chrome-nickel steel shafts, specially treated — taper roller bearings.

BRAKES: Internal expanding — external contracting — operating on rear axle drums, 14-inch x 2-inch ASBESTOS-faced.

SPRINGS: Semi-elliptic — front, 34-inch x 2-inch; rear, 48-inch x 2-inch. Silico manganese steel, eliminating all distortion.

SHOCK ABSORBERS: Pneumatic air check type, designed to absorb rebound without carrying load.

STEERING GEAR: LAVINE heavy-duty truck steering gear; irreversible split nut type.

FRAME: BRILL, pressed steel channel section — flexible type, 3½ inches deep, 2¼ inches wide, 5-32 inch thick. All cross members pressed steel, hot riveted, with integral gussets.

WHEELS: 30 inches front and rear, extra heavy — 1⅜-inch spokes of selected hickory, fitted with demountable rims.

TIRES: UNITED STATES 31 x 41 all-round plain-tread front — chain-tread rear.

GASOLINE TANK: Capacity, 10 gallons.

WHEELBASE: 105 inches — tread 56 inches.

GASOLINE MILEAGE: 20 to 25 miles per gallon — oil, 600 miles per gallon.

LOADING SPACE: 72 inches back of driver's seat.

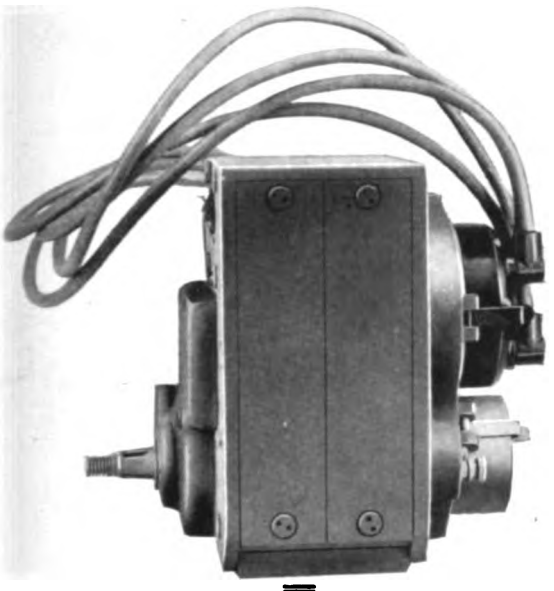
EQUIPMENT: GRAY & DAVIS electric, double-bulb head lights and tail light, electric horn, bumper, jack, tire pump, tool kit and extra rim.

BODIES: Fore-door panel; weight, 1950 pounds — fore-door, six-post express; weight, 1850 pounds — equipped with windshield, tire rack and rear fenders.

RUSH MOTOR TRUCK CO.

PHILADELPHIA

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"A Better Spark in a Simpler Way"

The TEAGLE High Tension MAGNETO

—for Trucks and Tractors

Truck and Tractor Service is of the severest character.

Dependable ignition under every condition, favorable or adverse, is imperative.

The Teagle High-Tension Magneto—the new American-designed and American-made model—ensures perfect ignition—a hot spark at all speeds.

SIMPLE IN DESIGN
STURDY IN CONSTRUCTION
DURABLE IN WEAR
EFFICIENT IN SERVICE
ECONOMICAL IN USE

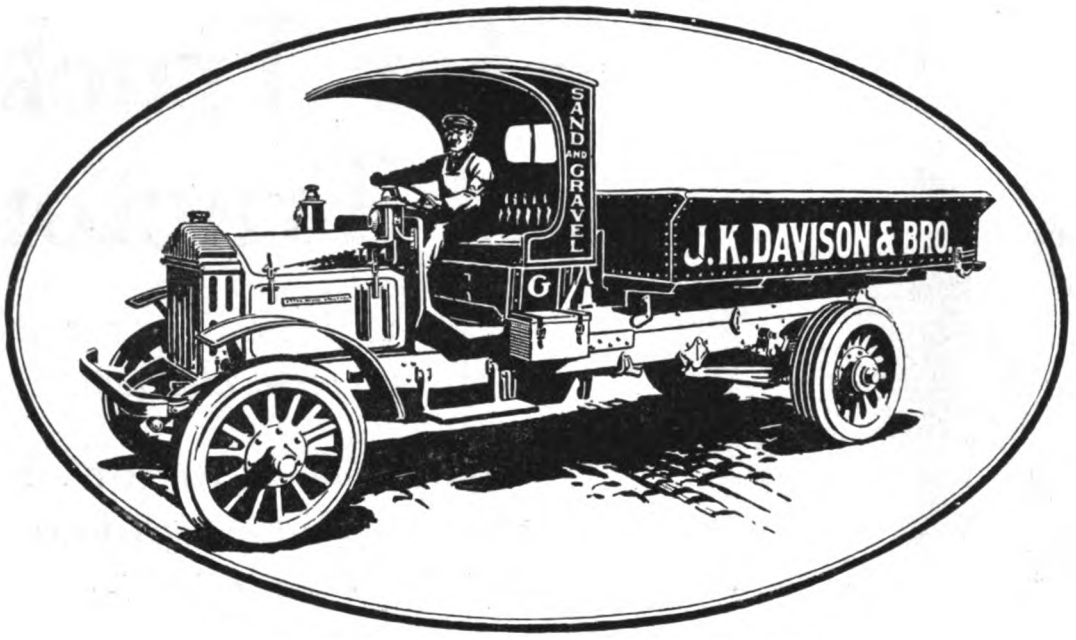
Dust-proof, water-proof, oil-proof, fool-proof, trouble-proof.

In two models—for four or six cylinder engines with fixed or variable spark.

WRITE FOR BOOKLET

THE TEAGLE COMPANY
Cleveland, O.

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Six
Pierce-Arrow Trucks
effect marked economies in service of
J. K. DAVISON & BRO.

J. K. DAVISON & BROTHER, the well-known Pittsburgh Sand and Gravel dealers have been able to effect a marked economy in transportation costs by the use of six 5-ton Pierce-Arrow trucks. The trucks do the work better, quicker and cheaper than the teams they displaced, and have proved much more reliable under all conditions of weather and traffic.

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While hauling sand to a building operation for the Pittsburgh Provision & Packing Company, one 5-ton Pierce-Arrow truck made in a single day forty-two return trips from the yard and back, carrying five tons of sand on each trip. The return trip covered just about one mile, and the truck hauled 210 tons in less than eleven hours.

Davison & Brother estimate that each two Pierce-Arrow trucks retire nine two-horse teams, giving better results at less cost. The trucks are of particular assistance in enabling Davison & Brother to complete rush jobs on contract time, and they have enabled the firm to handle profitably operations that would have been absolutely impossible with horses.

The firm maintains its own garage and mechanical force and the trucks are kept in top notch condition.

Davison & Brother have now decided to standardize their truck service with Pierce-Arrows as a result of their uniformly satisfactory operation under all conditions of service.

A number of interesting installations are shown in our booklet "What Pierce-Arrow Trucks are Doing in the Contracting Business." We shall be glad to send you a copy.



The Worm Gear
All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

THE PIERCE-ARROW MOTOR CAR COMPANY
Buffalo, N. Y.

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STRENGTH WITH LIGHT WEIGHT

The term "Strength" as applied to motor truck is synonymous with the name Hall, for in no other truck is that quality more dominantly typified.

Built to stand up under unusually heavy strains and hard usage, is nevertheless a marvel for balanced lightness. The most terrific tests that foreign engineers and drivers have been able to apply have failed to develop a single weakness in the Hall. Its strength finds no equal among motor trucks of its class for the simple reason that every strain-bearing part is made of extra dimension. That means fewer repair bills and less depreciation.

The makers of the Hall truck are structural iron workers. They know where and where not to put the strength in the chassis frame of a truck so that it will render the utmost in superior service.

Hall means security of truck construction—the lowest cost per ton mile and haulage every minute to maximum capacity.

LEWIS-HALL IRON WORKS

Manufacturers of the Hall Truck

(ESTABLISHED 1873)

Ferry Ave. and Grand Trunk Ry. **DETROIT, MICHIGAN**

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With This Line You Can Solve All Hauling Problems from ½ to 15 Ton

King TRAILER ANN ARBOR MICH.

Trailers and Semi-Trailers

One dealer has sold 157 King Trailers. Another took orders for two King Semi-Trailers the first day. All King Dealers are making wonderful sales records. You can do as well. Why not get posted today and begin reaping the dollar-harvest from this unequalled line?

The King Trailer is "The Trailer King"

Enthusiastic dealers and satisfied customers have named the King Trailer "The Trailer King." This name is a tribute to design, construction and service. The King Trailer leads its field. It is the best, lightest running and most economical trailer on the market. This is indicated by King specifications and proven by King performance. You need have no hesitancy in recommending the King to your most particular customers. It will stand up under the most trying conditions. The first King Trailer ever built is still "delivering the goods" for its owner.

King Trailer Specifications

Some trailers are make-shifts. Their manufacturers seem to forget that the trailer must operate under truck conditions. King Trailers are built like a truck to do a truck's work. They make a light delivery truck of any auto. King Trailers are built in three capacities—½ to ¾ Ton—to the following specifications:

Solid rubber, truck-type tires guaranteed for 7000 miles. Artillery wheels. Automobile pattern springs. Ball-bearing axles. Hardwood body frame. Adjustable oak draw-bar. King patent all-steel Universal motion, Shock-absorbing coupler.

You Can Dominate This Field

MAIL THE COUPON

King Semi-Trailers—the World's Best

The famous King Quality never showed to better advantage than in King Semi-Trailers. Like our trailers, they are correct in design, material and construction. Nothing is omitted to make them perfect in performance. Because the most important part of the Semi-Trailer is its fifth wheel—we have perfected the King-Irwin Universal Motion, Shock-absorbing Fifth Wheel. It is the only fifth wheel of its kind. The King-Irwin Fifth Wheel has insured the practicality of the semi-trailer. It makes the tractor-semi-trailer the most economical as well as the most practical vehicle for hauling loads from 1½ to 15 tons.

King Semi-Trailer Details

All King Semi-Trailers are equipped with the King-Irwin Universal Motion, Shock-absorbing Fifth Wheel. They are made in three capacities—1½ ton, 3 and 5 ton, to the following specifications:

	1½ ton	3 ton	5 ton
Body	5'6"x8'	5'6"x14'	5'6"x14'
Tread	56"	56"	56"
Height	43"	43"	46"
Tires	34"x3½"	34"x5"	36"x6"
Springs	42"x2½"	42"x3"	48"x3½"
Axle	1½"x2½"	2"x3"	2½"x3½"
Bearings	Roller	Roller	Roller

Our Liberal Offer to Dealers

The dealer who represents the King line dominates the light and heavy hauling field. His prospects are unlimited. Farmers, Merchants, Store Keepers, Printers, Plumbers, Contractors, Expressmen—in fact, every auto owner who has hauling to do needs a King Trailer. Mills, Factories, Lumber and Coal Dealers, Dairies, Storage and Moving Van Companies can cut loading, hauling and unloading expenses to bed-rock by use of King Trailers. We give liberal discounts, exclusive territory, remedial shipments, co-operative advertising, attractive advertising and sales helps. Also special discount and time concession for demonstrators. This is a mighty profitable proposition for you. Better investigate at once. Be the King representative in your locality.

King Trailer Company

612 Main Street Ann Arbor, Mich.

King Trailer Company
612 Main Street, Ann Arbor, Mich.

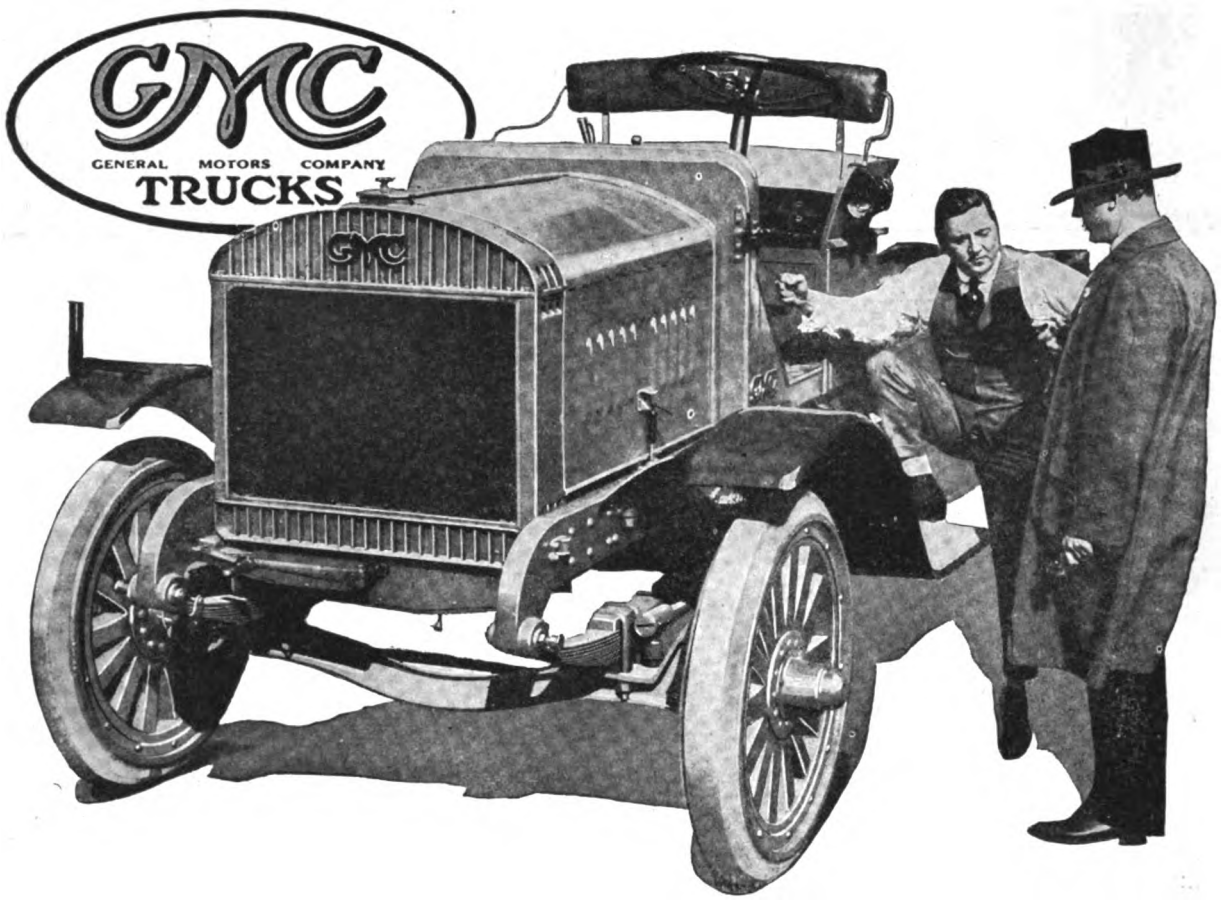
Gentlemen: Without cost or obligation on my part, please send me literature, price list, discounts, terms, sales plan and special demonstrator proposition on King Trailers, Semi-Trailers and Fifth Wheels.

Name .....

Address .....

Business .....

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His Statements are Backed By Thousands of GMC Trucks in Service

The GMC dealer is able to talk knowingly with the prospective owner in regard to what may be reasonably expected from GMC Trucks.

For GMC Trucks are not new on the market—not untested—nor untried.

For years, month in and month out, thousands of GMC Trucks in most all lines of business have been giving consistent, dependable service.

They have withstood the hardest kind of service on city streets—over roughest country roads—in the mountains—and thru the thick timber lands of the North Pacific, in many cases making their own roads—mastering difficult grades—standing the gaff and doing their work.

It matters not whether you require a ¾ ton truck with pneumatic tires for light delivery work or a fleet of the giant five-tonners for heavy hauling, you can come with confidence to TRUCK HEADQUARTERS.

Tell us the nature of your business—the distance to be traveled—the condition of the roads, and we will suggest the type and size truck which by actual test has proved to be the best truck investment for your business.

See the GMC dealer in your locality or write TRUCK HEADQUARTERS direct.

Let Your Next Truck Be a GMC

GENERAL MOTORS TRUCK COMPANY

New York
Philadelphia
Boston

PONTIAC, MICHIGAN

Distributors Most Everywhere

Chicago
St. Louis
San Francisco

(215)

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Actual photograph (no retouching) of cross section of Goodrich Truck Tire after 40,000 miles.

40,000 MILES

In Heavy Service

Less Than *Half* the Cushion Worn Out

ACTUALLY more than half the tread-rubber was left to cushion the load after this tire and three others had run 40,000 miles on a tank truck operated by the Gulf Refining Company at Birmingham, Ala.

These tires carried capacity loads. On each trip they crossed 24 railroad tracks and traversed a quarter of a mile of Belgian Block pavement—testing fairly their durability.

An exceptional record. But these are exceptional truck tires. There's big mileage and plenty of protecting cushion in every GOODRICH Truck Tire. Four others ran the same distance on another truck owned by the same company at Dublin. Ga.

These tires were not abused. They stand as eight specific examples of the long established fact—GOODRICH Truck Tires positively give the *greatest* mileage.

And the trucks are in excellent condition—proof that GOODRICH Truck Tires not only wear well but effectively protect truck mechanism against destructive vibration.

Make Goodrich YOUR next equipment.

THE B.F. GOODRICH COMPANY, Akron, Ohio

GOODRICH

TRUCK TIRES

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U.S. Ball Bea

One of the Leaders
or Just "Among Those Present"

IT'S comparatively easy to be listed as "among those present"—quite another proposition to be identified with the leaders.

¶ There are motor cars known as leaders—there are motor cars "among those present." The leaders usually may be identified by the fact that they are ball bearing equipped—that is, that they use ball bearings either exclusively or in dominant degree.

¶ So when somebody says "Why this car uses the same bearings as that car,—and that one,—and the other one"—see if the list he names isn't a list of "among those present."

THIS IS THE DAWN OF A BALL BEARING ERA

Bear in mind that the big problem of the day is efficiency, which means the overcoming or the elimination of waste. The greatest of all economic wastes is friction, and the greatest of all anti-friction devices is the annular ball bearing.

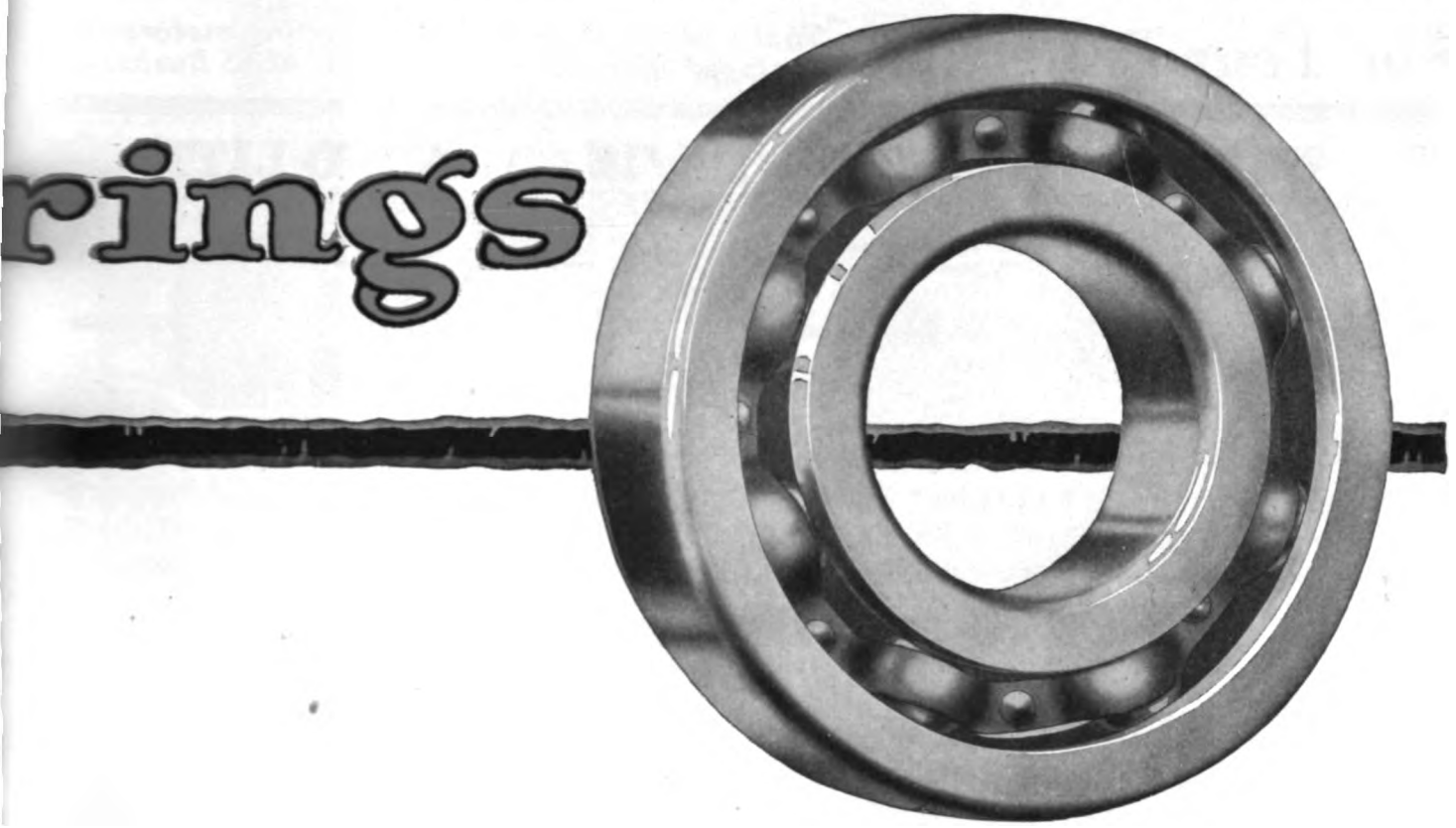
Highest efficiency in all revolving machinery can be obtained only by the use of ball bearings. Substitutes for ball bearings generally mean an initial saving by the manufacturer, but that saving is made at the expense of the ultimate user, in the shape of lower efficiency and consequently higher operating costs. The truth of this statement is responsible for the fact that today is really the dawn of a ball bearing era.

BALL

Ball Bearings for Efficiency

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rings



¶ Bear in mind, too, the fact that even some of the quality cars use substitutes for ball bearings in certain locations where inferior performance doesn't make so very much difference in the general operation of the car.

¶ But in real quality cars, ball bearings dominate any other type—in practically all of the imported cars ball bearings are used exclusively.

¶ U. S. Ball Bearings are manufactured in a new modern-equipped plant with a capacity of 10,000 quality bearings per day. U. S. Ball Bearings are produced in the following types:

Radial Type
Cup and Cone Type
Combination Double-Action
Plain Thrust
Grooved Thrust
Double Direction Thrust.

Our Engineering Department will gladly work in conjunction with any manufacturer in laying out ball bearing mountings and adaptations.

S.
EARINGS

U.S. BALL BEARING MFG. CO.
Conrad Patent Licenses
Palmer St. & Kolmar Avenue, Chicago Ill.

Other Bearings for Price

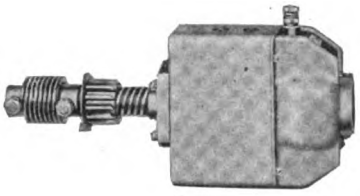
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For Your Protection: That's why leading makes of starting motors are equipped with Bound Brook OIL-LESS Bushings

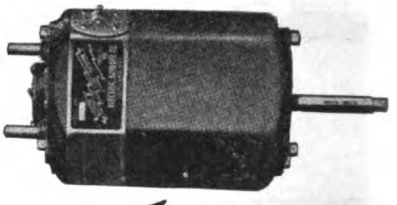
DELCO
BOUND BROOK EQUIPPED



GRAY & DAVIS
BOUND BROOK EQUIPPED

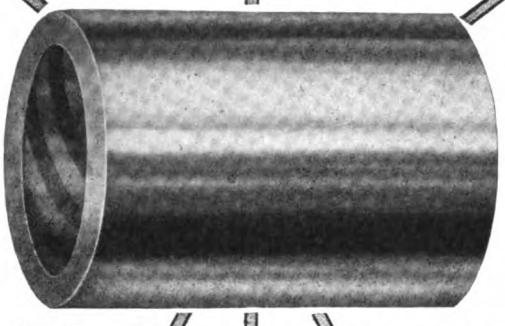


AUTO-LITE
BOUND BROOK EQUIPPED



Nothing is more liable to neglect than the lubrication of the inaccessible bushings of a starting motor. Lack of lubrication means short life for an ordinary bushing.

For this reason over 50% of all different makes of starting motors are equipped with BOUND BROOK (*Graphite and Bronze*) Oil-less Bushings.



Bound Brook Oil-less Bushings require less lubricating attention to give efficient service, for they are self-lubricating, and, even if neglected, you are assured of continued service. OIL in no way harms these trouble-less bushings.

By using Bound Brook Oil-less Bushings manufacturers of starting motors guard their products against neglect, thereby insuring years of satisfactory service and efficiency for users.

BOUND BROOK

TRADE MARK REG. U. S. PAT. OFF.

Oil-Less Bushings

The life of any type of machinery is dependent upon the life of its bushings. When bushings are inaccessibly located and therefore difficult or impossible to properly lubricate, the use of BOUND BROOK Oil-less Bushings is essential to economy and efficiency.

For this reason you will find "BOUND BROOK" Bushings at many bearing points in leading makes of automobiles, trucks, aeroplanes and submarines, as well as in hundreds of different types of machinery.

Their silent, smooth running qualities and their ability to remain in perfect condition, even if neglected, naturally make these trouble-less bushings the logical choice of the leading manufacturers of starting motors.

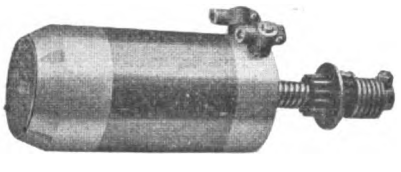
We also manufacture NIGRUM (*Impregnated Wood*) Oil-less Bushings.

All Genuine Graphited Oil-less Bushings have always been made at Bound Brook, U. S. A.

BOUND BROOK OIL-LESS BEARING COMPANY
Bound Brook — Specialists in the manufacture of Oil-less Bushings for more than a third of a century — New Jersey



BIJUR
BOUND BROOK EQUIPPED

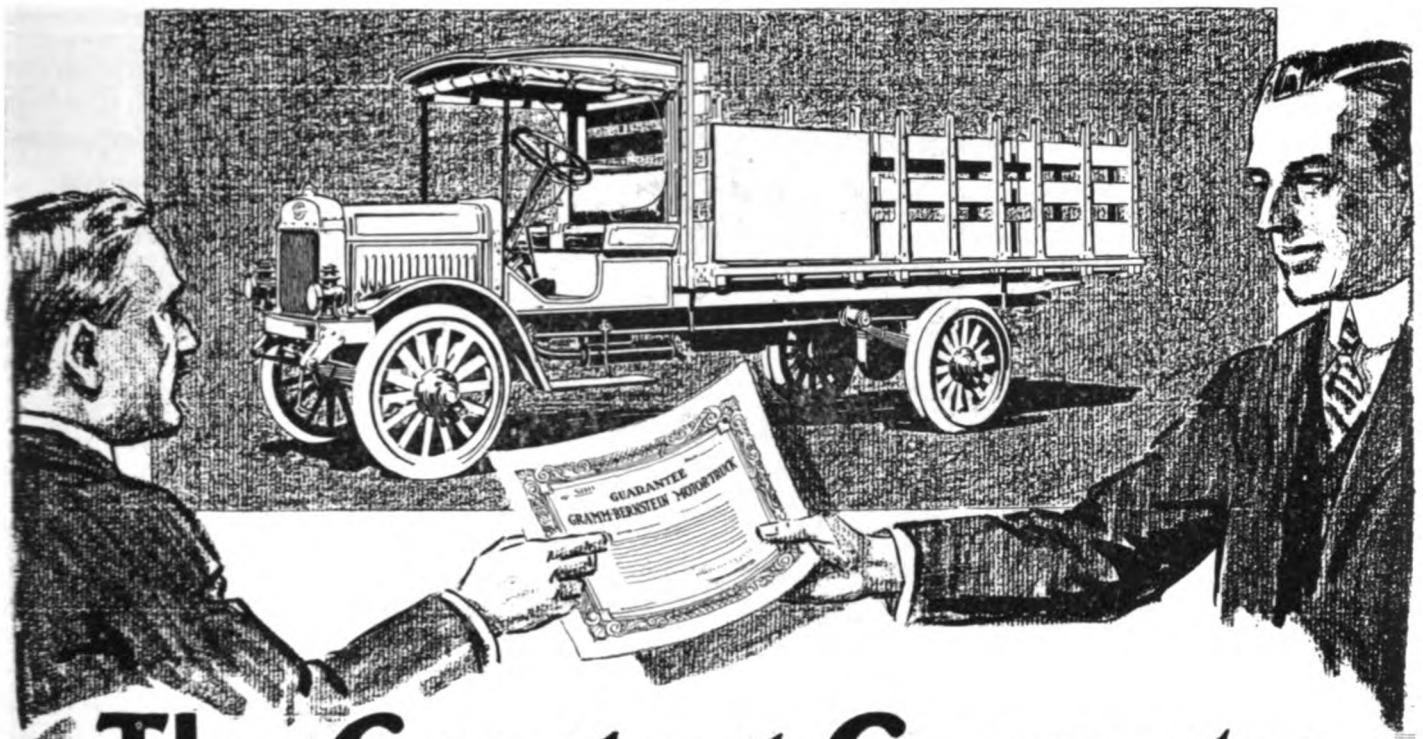


KEMCO
BOUND BROOK EQUIPPED



DYNETO
BOUND BROOK EQUIPPED

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The Greatest Guarantee Given with Any Motor Truck







Transmission

Guaranteed for the entire life of the truck. Gramm-Bernstein transmission is trouble-proof. No shifting—every gear is always in mesh. Speed changing is accomplished between heavy dog clutches—more than seven times as strong as gear teeth. This sturdy, dependable mechanism defies careless drivers and makes for constant efficiency. As further evidence of our faith in the G-B truck we guarantee the entire truck for one year—practically all others are guaranteed for only 90 days.

Radiator

Guaranteed for the entire life of the truck. The G-B radiator is formed of seamless helical tubing between two cast water tanks. In case of accident, instead of "laying up" for repairs as with other types, just take out the damaged tubes, whittle some plugs for above and below, and go on as if nothing had happened. New tubes are easily installed and no running time is lost. This is only one advantage of the perfectly designed G-B truck—and it's backed by a life-of-the truck guaranty.

Springs

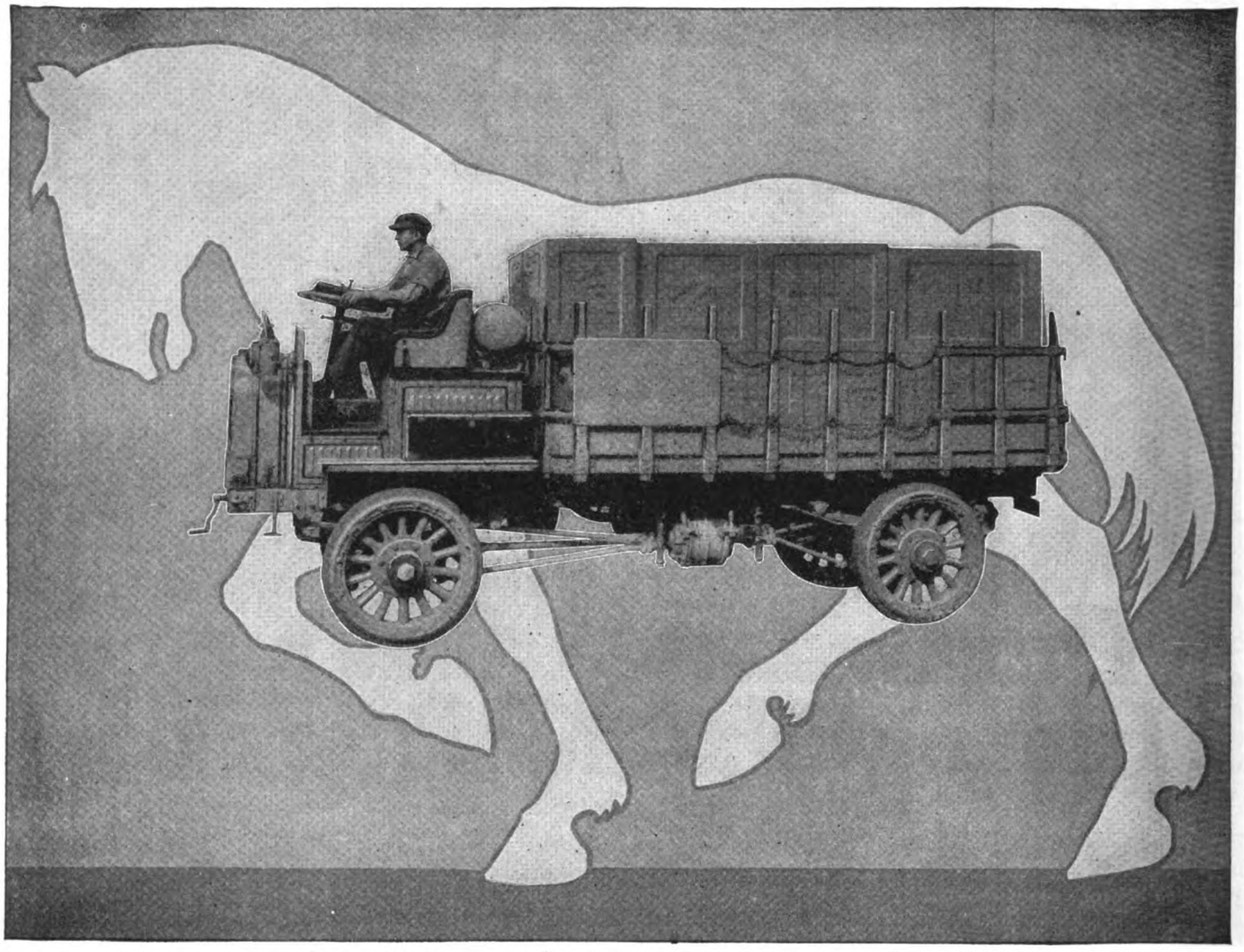
Guaranteed for the entire life of the truck. Drive and torque is taken through rear springs. There are no torque and radius rods. Rear axle is relieved of strain, the pressure of quick power application being absorbed by the flexibility of spring leaves, which are long, wide and flat. Their special construction—the result of 16 years of development—makes them absorbers for both vertical and horizontal shocks. The G-B guaranty is the owner's protection—it's his assurance for uninterrupted and economical service.

Every other G-B feature will stand the same comparison. We claim that the G-B truck has every good feature of all other trucks plus many exclusive advantages. Consider what a wonderful help the great G-B guaranty means to dealers—and it is backed by 16 years of good truck performance. May we send you details of the G-B dealers' proposition?

The Gramm-Bernstein Motor Truck Co.
13 Gramm Blvd. Lima, Ohio

THE GRAMM-BERNSTEIN COMPANY—LIMA-OHIO-U.S.A.
GRAMM BERNSTEIN
MANUFACTURERS OF HIGH GRADE WORM DRIVE MOTOR TRUCKS — 1-1½-2-2½-3½-5-6 TONS

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Driving Power on All Four

—pulling traction front and rear—every wheel a driving wheel! This four-wheel-drive principle as correctly applied, is responsible for the amazing performance, absolute dependability and extreme economy of

F-W-D Trucks

Not only will the F-W-D perform any task that any other truck built will perform on ordinary roads or pavement—*and* at somewhat less operating cost, *but also* it will do many things over practically impassable roads, or no road at all—through mud and sand, gravel and broken stone, that no other truck could possibly achieve. The distributed load weight—45% front, 55% rear—together with the four-wheel-drive reduces tire wear and tire expense to the minimum; dual rear tires are *not* used, yet the tire manufacturers give the *same* service guarantee as for dual tires—*one-third saved.* Write us today for booklets, descriptive catalog and complete particulars.

DEALERS—There is some excellent open territory for responsible business men who desire to make a permanent connection. Write us for details.

FOUR WHEEL DRIVE AUTO COMPANY, Dept. K, Clintonville, Wisconsin

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HESS-BRIGHT

SEND FOR THIS NEW LITERATURE

HESS-BRIGHT BALL BEARINGS

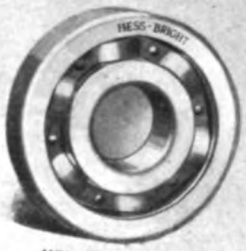
HOW TO APPLY THEM

HESS-BRIGHT MANUFACTURING CO.
PHILADELPHIA, PA.

The Application of Ball Bearings to the Airplane

THE HESS-BRIGHT MANUFACTURING CO.
PHILADELPHIA, PA.

THE CARE OF BALL BEARINGS

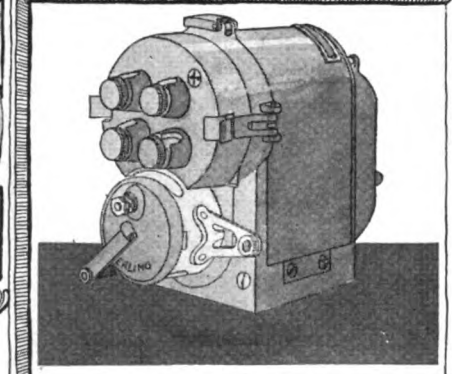


HESS-BRIGHT
MONARCH BALL BEARING

THE HESS-BRIGHT MANUFACTURING COMPANY
PHILADELPHIA, PA.
MANUFACTURERS OF THE "BETTER BEARING"

THE HESS-BRIGHT MFG. CO.
FRONT ST. AND ERIE AVE.
PHILADELPHIA, PA.

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WORTH MORE

DOES MORE

The LOCOMOBILE deserves the Berling Magneto

IN the pleasure-car field, there is no more conscientiously constructed car than is the Locomobile. The Locomobile deserves the Berling and has adopted it, after two years of almost continuous test.

The reasons are myriad; here are a few:—

The Berling's spark meets the demands of the most stringent and skeptical of engineering tests. The Berling's spark is not only hot and fat, but is constant—and adequate at all speeds.

You may profit by the years-long tests of the great engineers. Let the Berling insure your motors against ignition trouble.

Ericcson Manufacturing Company

1110 Military Road, Buffalo, N. Y.

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BETTER TIRES–BETTER SOLD

From the very beginning of the motor truck industry Goodyear has led in the introduction of new and better types of tires—enabling manufacturers to build machines more and more efficient.

First came the hard-rubber-base tire, strikingly better than any former tire, yet but a crude promise of Goodyear's present product.

Then came the first demountable, then the pressed-on type—greatest single advance in the making of tires for trucks.

Finally come a perfected demountable tire, called the Goodyear Hand-Attachable, and the Goodyear S-V Pressed-On Tire—twin brothers and famous for their marvelous mileages, sometimes exceeding 40,000 in city use. Then the Goodyear Motz Cushion Tire, used everywhere for light, fast delivery service.

Thus Goodyear has now a perfected tire for every type of truck and service. If new uses develop Goodyear will be ready with tires to meet them.

But the making of an article is only half the battle. Selling it, today, counts equally.

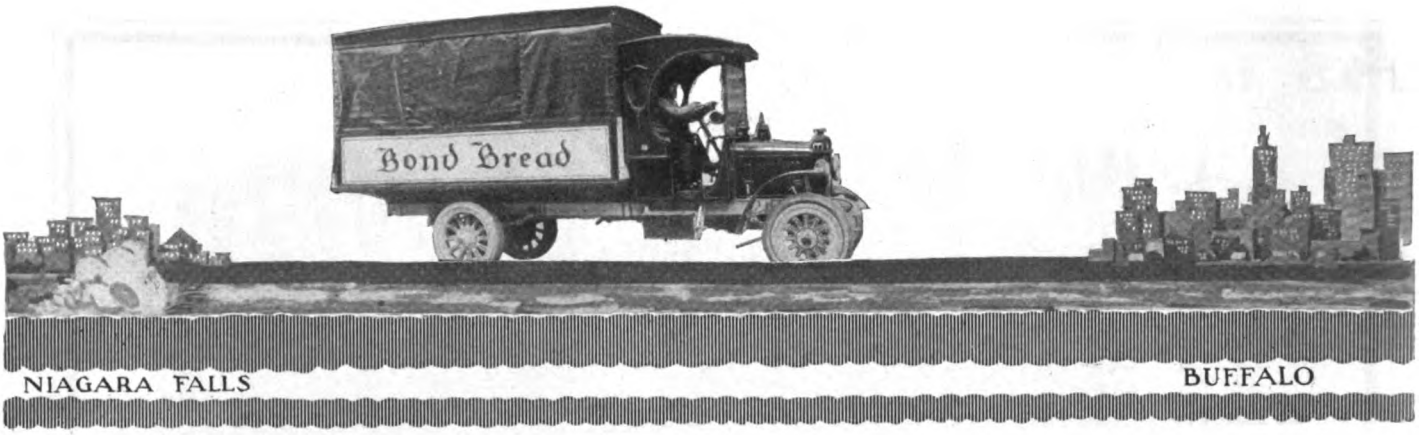
SO Goodyear has not stopped with improving the quality of tires but has improved the *distribution* of them, establishing more and more Goodyear Truck Tire Service Station Dealers until now hundreds of these dot the country and offer convenient, prompt, efficient service to every truck owner in the land. Only Goodyear does this.

So Goodyear Truck Tires, better, are also better sold.

The Goodyear Tire & Rubber Co.
Akron, Ohio

GOODYEAR
AKRON

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This ATTERBURY

MAKES 150 MILES EVERY DAY

With the letter shown below, and with hundreds of others like it—could you sell the Atterbury?

Would the Atterbury stay sold? Would each Atterbury sell another Atterbury for you?

Those are foolish questions to ask of any man who knows anything about the truck business. Think it over! These are not mere claims—these are documentary facts.

Hadn't you better wire the Atterbury for their dealership proposition?

GENERAL BAKING COMPANY

CORNER CLINTON AND ADAMS STREETS

COLLINS BAKERY

BUFFALO NEW YORK

May 31st, 1917.

Atterbury Motor Car Co.
Buffalo, N. Y.

Gentlemen:-

It might interest you to know that our Atterbury 2-ton is delivering Bond Bread to Niagara Falls all night,—every night—and is giving us a half day's good service here in town, in addition.

We have found the Atterbury economical and efficient.

Yours very truly,
COLLINS BAKERY.
MANAGER.

JBD/B

Atterbury Motor Car Company
Buffalo, N. Y.

ATTERBURY

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As a Dealer, just what sort of a truck manufacturer do you want to represent?

Are not these your requirements?

High financial standing
Long manufacturing experience
Large factory organization
A complete line of trucks
Ability to make prompt deliveries
Last but not least—A substantial, living discount

The manufacturers of Wilson Trucks have been in business in Detroit for a period of thirty-five years. For a quarter of a century we built heavy duty horse-drawn vehicles, up to ten and twelve tons' capacity. We *know* how to solve haulage problems. We have ample room—our plant is 633 feet long by 107 feet wide.

And We Invite Financial Investigation

If this is what you want—permanence, profit, persevering co-operation, and a name on your product backed by thirty-five years of manufacturing success—write us for our agency proposition.

J. C. WILSON COMPANY, 486 Warren Avenue, Detroit, Michigan

WILSON TRUCKS

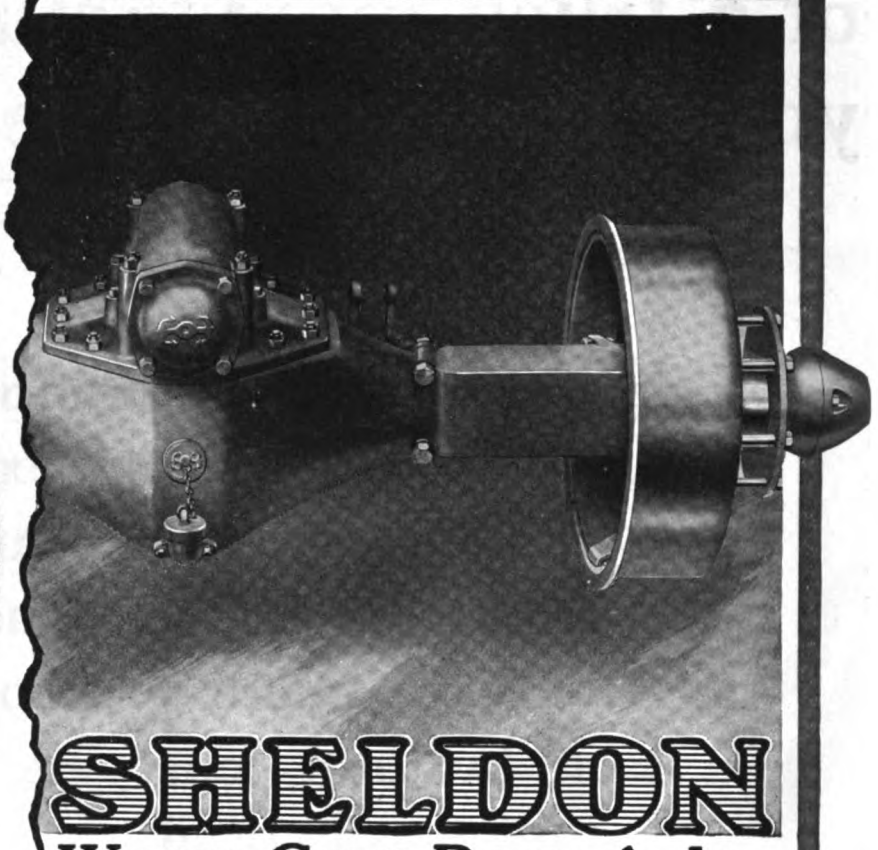
PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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11

THE average motor car in private use is lucky if it gets overhauled once a year. But how much better it would run could it but have the twenty-six thorough inspections and overhaulings which are received, one every fortnight, by every

Fifth Avenue Bus



SHELDON

Worm Gear Rear Axles

Reduce Upkeep Costs Materially Because They Facilitate Frequent Inspection and Overhauling

THIS IS THE DISCOVERY of the Fifth Avenue Coach Company after three years' thorough test of every type of axle and drive available. As the result of this test they have decided to use Sheldon Worm Drive Rear Axles exclusively in the future.

Sheldon Worm Gear Rear Axles are superior from the operating standpoint because they save maintenance costs in the following ways:—

1—By permitting a demountable wheel, allowing inspection and wheel changes with minimum cost for labor and depreciation.

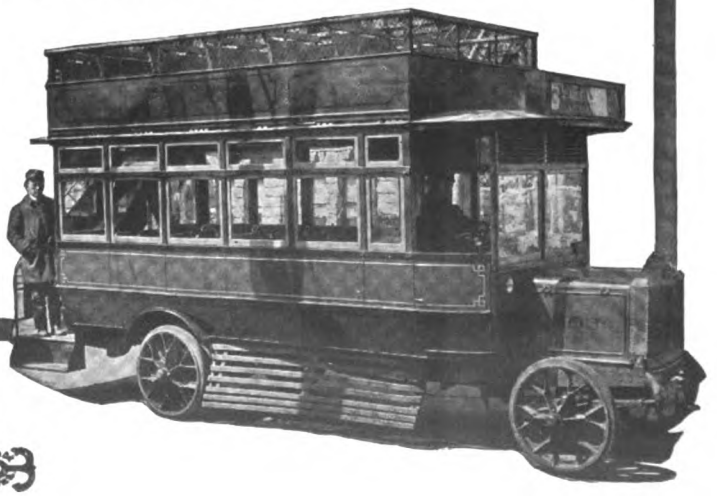
2—By having their wheel bearings enclosed in the main casing, protecting them from grit and thereby reducing the cost of bearing maintenance significantly.

3—By the superior construction of Sheldon brakes, giving longer service with maximum efficiency and requiring a minimum of inspection, adjustment and repair.

4—By securing the silent operation that the public is coming to demand.

THE SIGNIFICANCE of this three-year test by the Fifth Avenue Coach Company is doubled by the fact that very few firms in the United States are in a position to make so exhaustive a test. It brings out facts no manufacturer of trucks and heavy service vehicles can afford to neglect.

IF YOU ARE INTERESTED we can send you a reprint of a letter from the Fifth Avenue Coach Company giving their reasons for the adoption of Sheldon Axles in detail.



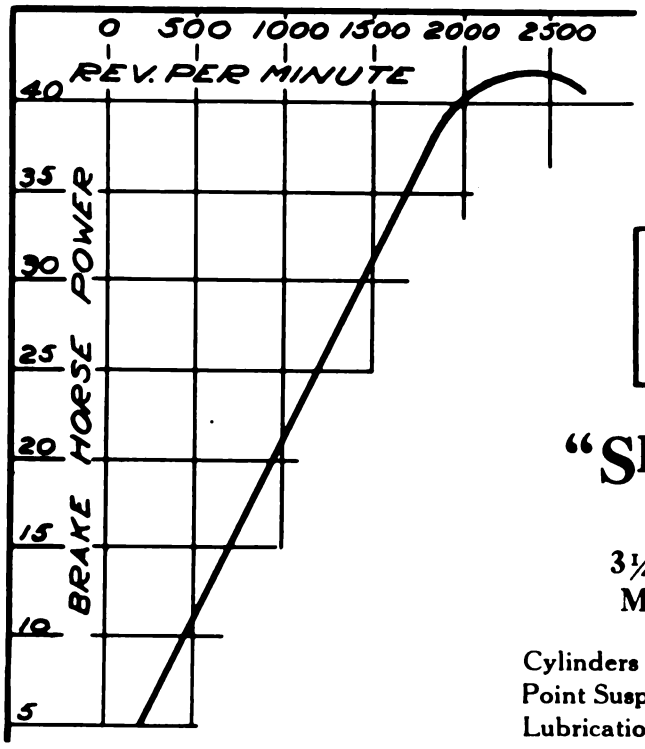
Sheldon Axle & Spring Co.

Makers of Springs and Axles for Heavy Duty Service for over Fifty Years

WILKES-BARRE, PENNA.

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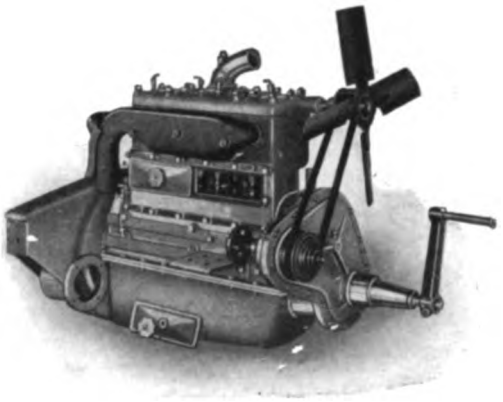
"SPILLMAN 4" PERFORMANCE



SPILLMAN 4
3 1/4 X 5 - 4 CYL

"SPILLMAN 4" ENGINE

3¼" x 5"—4 Cylinder
Model 2700, Type I



Cylinders in block, Removable head, 3 Point Suspension, Thermo-Syphon cooled. Lubrication: Force-feed to Main Crankshaft, Camshaft and Pumpshaft Bearings; Splash to upper and lower Connecting-rod Bearings and Cylinders. Weight 475 lbs.

S. A. E. Rating: 16.9 H. P., for actual brake test see power curve above. Adapted to take any standard starting, lighting and ignition equipment. Bell-housing Nos. 4 & 5, S. A. E. Flywheel for 8" and 10" Borg & Beck clutch, also cone clutch.

Since the announcement that we were building a large addition to our factory to provide capacity for the new SPILLMAN "4", and before we are in production with this model, thirty-eight manufacturers of automobiles, trucks and tractors have asked to be written into contracts covering 58,000 motors of this model, for delivery during the next twelve months.

HERSCHELL-SPILLMAN COMPANY
NORTH TONAWANDA, NEW YORK, U. S. A.

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U. S. Trucks
Floating Power Plant

A dealer success quickly won

Riordan Brothers of Baltimore are successful importers of coffee, tea and rice and until a few months ago had no interest in or knowledge of motor trucks.

Investigation of conditions convinced them that the retail distribution of a good truck offered a profitable business opportunity.

They studied many truck propositions, going into truck construction, stability of the manufacturer, personnel of the organization and every other significant detail.

Then about October 1, 1916, they became dealers in the Baltimore territory for U. S. trucks.

Nearly every other prominent truck was represented there and competition was keen but it was new territory for the U. S.

Since that time, Riordan Brothers, whose truck interests are directed by George J. Riordan, Charles E. Riordan and J. W. Bayard, have placed forty U. S. trucks in service, and have now on order nearly one hundred more. They made the pioneering period pay a profit.

The Floating Power Plant helped to make sales. U. S. trucks in the service of owners made good. They brought repeat orders. They secured the most valuable sort of sales co-operation from their owners.

The firm is now established in one of the finest sales and service stations in the city. Its truck business is bigger every month.

There may be an opportunity like this in your town.

Worm-Drive, 2½, 3½ and 5 ton. Chain-Drive, 2½ and 3½ ton.

THE UNITED STATES MOTOR TRUCK COMPANY, CINCINNATI, O., U. S. A.

New York · Philadelphia · Baltimore · Pittsburg · Cleveland
Detroit · Chicago · Atlanta · St. Louis · Boston

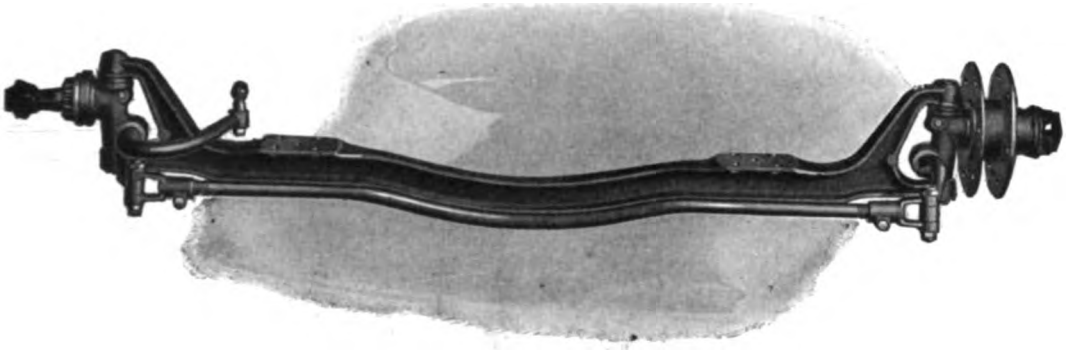
Dealers in all commercial centers



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COLUMBIA

FRONT AXLES for MOTOR TRUCKS



DESIGNED and constructed as **Truck** Axles to withstand the severe service and abuse encountered in commercial deliveries—and endowed with a wide margin of overload capacity. I-Beam forgings, double heat-treated; chrome-nickel Spindles and Steering Arms; two heavy duty roller bearings in each hub.

Made in Three Sizes for

½-ton Trucks—¾- to 1-ton Trucks—2- to 2½-ton Trucks

Built with the same degree of careful attention and following the same general principles of construction that have won unqualified approval for Columbia Pleasure Car Axles. We are still able to make

Prompt Deliveries

THE COLUMBIA AXLE COMPANY

Cleveland, Ohio

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Kissel ALL-YEAR Cab

(PATENTS APPLIED FOR)



The ALL-YEAR *Cab in winter showing use of winter attachments*

The ALL-YEAR *Cab in summer, without winter attachments, is standard equipment on four Kissel Truck Models*

All-Year Comfort for Drivers Increased Results for Owners

HERE is Kissel's contribution to the truck field—the **ALL-YEAR *Cab***—the application of the idea to trucks that changed the motoring habits of a nation in the passenger car field—a feature that will be eagerly welcomed by motor truck drivers and owners alike because it—

Protects drivers in wet and stormy weather—
Removes the necessity of layups on account of rain or snow storms—
Discourages speeding to get under cover—diminishes possibilities of accidents and excessive wear and tear—
Increases the efficiency of the drivers by improving driving conditions—
Insures competent handling and care of trucks by attracting high class operators.

Keeps trucks in operation the year around regardless of weather—

In its open summer form it is standard equipment on four new Kissel truck models, providing drivers with a cool, open housing. In winter the ALL-YEAR Cab is quickly changed into a warm, dry, closed cab—weather-proof, draught and leak-proof—by adding the winter attachments.

Investigate the* ALL-YEAR *Cab that insures all-year efficiency and comfort for drivers and increased results for owners. It is exclusive on four of the new Kissel Truck models.

Kissel Motor Car Company, *Hartford, Wis., U. S. A.*

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with New Line of Kissel Trucks

Kissel's ALL-YEAR *Cab* mounted on the new Kissel Trucks makes the greatest combination for efficiency and economy in the motor truck field today.

Announcing the Five New Kissel Truck Models—

UNUSUAL strength, power and durability—are some of the characteristics of the new Kissel Truck Models—designed and built to meet economically and efficiently the present day haulage and delivery requirements.

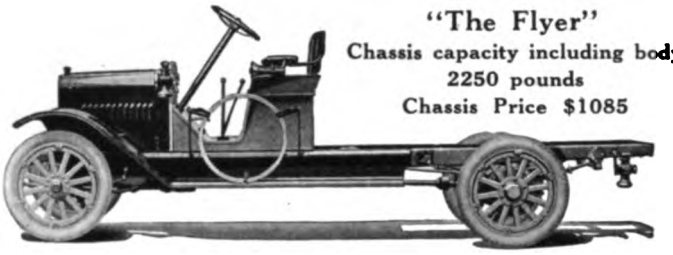
Never before has there been such a wonderful line of quality trucks selling at prices that emphasize their unusual value.

In no other line of trucks will you find the Kissel built-in quality that insures durability and reliability. Investigate the perfected worm drive rear axles, superior front axles, specially heat treated frame and scientifically constructed chassis.

From "The Flyer," Kissel's Light Delivery Car, on up through the different models to the "Dreadnaught"—whichever size model you select, you are sure of getting the greatest values in the truck market today. The results of our intensive and extensive study of the haulage and delivery requirements of over 200 different lines of business—yours among them—is more apparent than ever.

See your Kissel Truck dealer today or write us for specifications and up-to-date literature on the new Kissel Truck models and the new ALL-YEAR *Cab*.

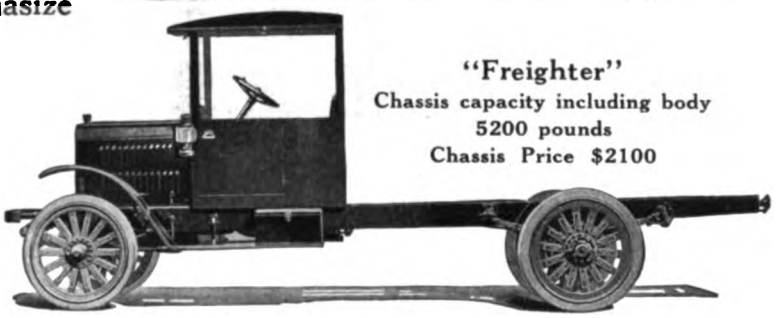
Dealers The exclusive selling feature of Kissel's ALL-YEAR *Cab* and the new Kissel Truck line-up means substantial sales in your city or town. Your local truck buyers will no longer risk their trucks in the hands of unprotected drivers—they will not experiment in trucks with lesser reputation than that of Kissel Trucks. Prompt action is needed on your part. Write or wire us immediately for agency details.



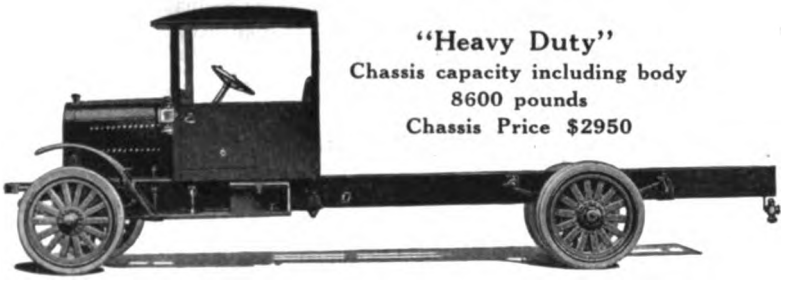
"The Flyer"
Chassis capacity including body
2250 pounds
Chassis Price $1085



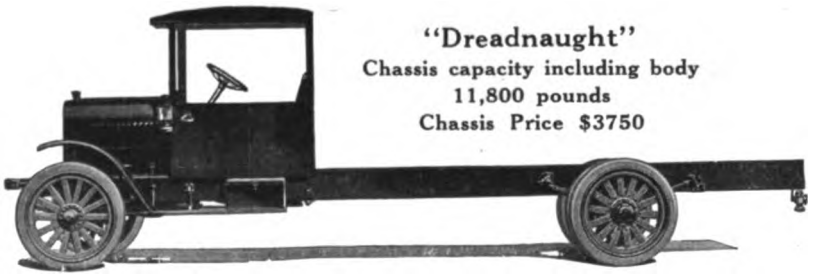
"General Utility"
Chassis capacity including body
3400 pounds
Chassis Price $1485



"Freighter"
Chassis capacity including body
5200 pounds
Chassis Price $2100



"Heavy Duty"
Chassis capacity including body
8600 pounds
Chassis Price $2950



"Dreadnaught"
Chassis capacity including body
11,800 pounds
Chassis Price $3750

The* ALL-YEAR *Cab* *in its open summer form is standard equipment on all Kissell Truck models excepting "The Flyer" Light Delivery Car. Winter attachments consisting of windshield, side, door and rear windows, $50 extra.

Kissel Motor Car Company, *Hartford, Wis., U. S. A.*

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"The Spring Is the Thing"



MATHER

Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

Minimum of Vibration

Genuine made only by

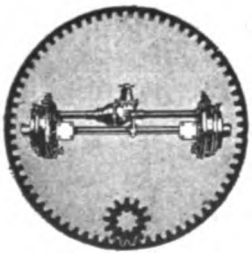
The Mather Spring Company

Toledo, Ohio

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Ammunition



Dealers of Russel equipped motor trucks find business unusually good—Why?

They are well fortified with strong, convincing selling ammunition—the kind that carries with telling effect.

Prospects already know the principle of the Russel Drive, for it is the most simple drive manufactured, and they believe in its claims.

Russel advertising, appearing in The Saturday Evening Post, Literary Digest, and in all the leading trade publications, tells the Russel Drive story in a clear, concise way.

You should be a dealer of a Russel equipped motor truck.

Russel Motor Axle Company
North Detroit

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The COMMERCIAL VEHICLE
Read by Business Men

Published on the first and 15th of every month
Entered as second-class matter, September 18, 1906, at the Post Office, New York, N. Y., under Act of Congress, March 3, 1879

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New York City

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Canada ..... 3.00 per year
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Changes in copy for advertisements in the next issue to be in the office of publication not later than 10 days before date of publication

"OLD HICKORY"



Army Engineers Use It for the Strenuous Business of War

Motor Trucks for Field Service in time of war must be positive in every quality. They form an all-important unit in a relentless force—the U. S. Army. They are engaged in a service the requirements of which *must* be met.

There can be no excuse of adverse conditions, unfavorable circumstances, etc., etc. A task before or within the ranks of this organization must be done, *regardless.*

Trucks in such service must operate independently of a service station, and that operation to be dependable must be positive.

"OLD HICKORY"
Fills Service Requirements

That "Old Hickory" trucks fulfill these requirements and withstand the gruelling tests of Army Field Service is but another proof of their absolute dependability and adaptability to the less exacting conditions of commercial service.

Moreover, the United States Government has selected the manufacturers of Old Hickory Motor Trucks, the Kentucky Wagon Mfg. Co., to assemble its motor ambulances for this war, and to make all necessary road tests before shipping to the front.

Electric Self-Starting and Lighting, rides as easy as a pleasure car, and simple as A B C to operate and control.

Built to stay at work on the job and out of the repair shop—and does it.

Read This

As an indication of the confidence men have in OLD HICKORY Trucks, we have but to tell you that Merchants, Contractors, Dairymen, and some Farmers in sections where we do not have dealer representation are buying OLD HICKORY Trucks by mail "Sight unseen." When you consider the reluctance of the average man to invest in a motor vehicle removed from a service station, you can better understand OLD HICKORY dependability and popularity.

We will make the OLD HICKORY Truck a Profitable Business Asset for one live dealer in **Your** territory. Particulars on request.

CHASSIS
$875
At the Factory

Also furnished with Open or Covered Express Bodies when desired.



Kentucky Wagon Mfg. Co.
Louisville INCORPORATED **Kentucky**

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"WE operate eight motor trucks and the Autocar is the handiest truck we have," says the Shanahan & Elliot Ice Cream Co., of Philadelphia. "It averages 50 to 60 miles a day, and its remarkably short wheelbase for two tons capacity enables it to get in and around the narrowest streets to make deliveries. We have just bought a second Autocar and expect to get more this spring."

Write for illustrated catalog and list of more than 4500 concerns using Autocars in every line of business

THE AUTOCAR COMPANY

ARDMORE, PA.

Established 1897 **MOTOR DELIVERY CAR SPECIALISTS**

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The COMMERCIAL VEHICLE
Read by Business Men
Vol. XVI July 15, 1917 No. 12



General view of the Second Pool Co.'s plant, which is entirely waterborne on the Allegheny River. The whole plant, including the office, overhead hoppers, weighing scale and locomotive-type crane with its clamshell bucket to lift the coal from barges into the hoppers, is mounted on floats warped together to form a unit. One of the trucks may be seen leaving the float by means of a short drawbridge at the extreme right

Pittsburgh's First Coal Truck User Finds That Motors Pay

Second Pool Co.'s Trucks Take Care of Business Growth in Outlying Sections—Street Congestion Makes Horses Cheaper on ½-Mile Hauls

THE Second Pool Coal Co. was the first concern to introduce motor trucks into the retail delivery of coal in Pittsburgh, Pa. It purchased its first truck, a 4-ton Dayton, early in 1910. Its action at that time was condemned as foolhardy by all the other coal dealers in the city and by all of the heavy-haulage concerns.

The wisdom of its move at that time has since been completely vindicated by the increase of its own fleet of trucks and by the fact that practically every coal merchant in Pittsburgh now uses motor vehicles for coal delivery.

Pittsburgh a City of Short Coal Hauls

So far as the coal trade is concerned Pittsburgh is a city of heavy loads delivered over short hauls of between 4 to 5 miles each way, or from 8 to 10 miles a round trip. These conditions are due to the fact that the coal dealers are pretty well scattered, thereby enabling a dealer in one section to deliver more cheaply in his own neighborhood than one located several miles away. This cost of delivery is also affected by the physical lay-out of the city and its surrounding territory.

While the business section of the city proper is located on practically a level plain in the shape of a triangle formed by the confluence of the Allegheny and Monongahela rivers with the Ohio, the country on the opposite sides of the two rivers is at a considerably higher level and makes necessary steep climbs or

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Perspective sketch of the plant, showing the various barges of which it is composed. The lines with the arrows indicate the course of the trucks from beneath the chutes of the overhead hoppers, over the weighing scale near one end, up the river bank and up onto the paved city street paralleling the river edge. At the usual water level, the distance between the edge of the plant and the street is between 250 and 300 feet. This has a grade of approximately 22 per cent, which is steeper than a fully laden 4-ton truck can negotiate easily, so that a 25-hp. electric cable winch is used to help the trucks up the gradient

the use of inclined railways, which charge a rate of 15 cents a ton for the total weight of the vehicle to carry it from the lower to the upper level. While the use of the inclined railways undoubtedly saves money compared with the cost of running heavily laden trucks up the steep roads, it adds an appreciable amount to the delivery cost and makes it easy for a coal dealer in one locality to considerably underbid the price of another dealer located outside of that territory.

Most Coal Delivered in 4-Mile Zone

For these reasons practically all of the coal handled by the Second Pool company is delivered within an area formed by circumscribing a circle about the plant with a radius of 4 miles. While the Second Pool company was the first concern to employ a truck for the delivery of coal in Pittsburgh, it did not rush in blindly and replace all of its horse vehicles because of its belief in the efficiency of motor vehicles. Its first truck was tried out for a year and then replaced by a 3½-ton Alco, which was operated during 1911 and 1912, at what is said to have been the lowest cost of any Alco in use in the entire city of Pittsburgh. Two other Alcos were purchased, one late in 1912, so that the Second Pool fleet now consists of three 3½-ton trucks suitably braced to carry total loads of 4 tons.

Eighteen Wagons Still Maintained

The company still maintains eighteen wagons and thirty-six horses because it has found that horses are cheaper for delivering within a 2-mile radius of the plant. This is due to unavoidable delays in loading and unloading and vehicular congestion which does not allow the full speed capabilities of the truck to be realized.

Further experiments carried out by the company proved that for hauls within a ¼-mile zone drawn about the plant as a center the truck cost was three times that of the horses. In the 1-mile circle it was one-and-a-half times as great as horses, while at the 2-mile circle the costs of delivery of both horses and trucks were on a par. Beyond the 2-mile delivery zone, trucks were found to be not only cheaper than horses but to render a much quicker and more satisfactory service.

50 Per Cent Idle Time on Short Hauls

The reasons for the greater cost of the truck delivery within the 2-mile zone may be readily understood when it is known that in this work they are operating only 50 per cent of their possible working time. This is easily shown by a comparison of the loading and unloading times with the total time of a trip within the 2-mile zone. Such a trip requires about 1 hour's time, which is divided into 20 minutes for loading and screening a 4-ton load, 10 minutes for unloading and 30 minutes for actual running. The 20-minute-loading period plus the minimum 10-minute unloading time makes a total of 30 minutes idle truck time, which, divided by the 60 minutes required for the complete trip, gives a ratio of 50 per cent for the total time per trip. This percentage is reduced more and more the farther out the truck delivers. For instance, a delivery at the 4-mile circle takes about 2 hours. In this case the loading and unloading time

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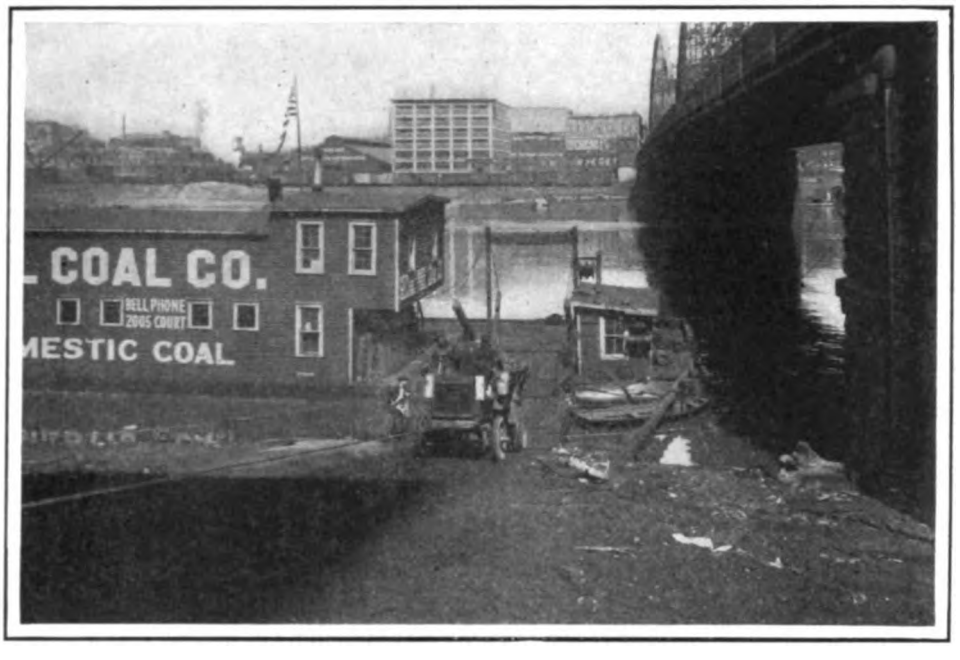
remains the same as before, 30 minutes. The total time of the trip is double, so that the percentage of idle time is only 25 per cent.

As approximately 75 per cent of the 400-ton daily output of the company is delivered within the ½-mile radius from the plant, the horses are relied upon for the greater portion of the delivery work. The trucks have taken care of the expansion of the company's business outside of the zones in which the horses are cheaper. Steam plants take about 75 per cent of the coal sold by the Second Pool company, leaving about 25 per cent for the domestic trade.

In case the business in the ½-mile or downtown zone, in which the greater portion of the steam plant coal is delivered, becomes extremely heavy, additional horse wagons are hired at the rate of 75 cents per hour, including both wagon and driver. If the Second Pool company furnishes its own wagon, the rate is reduced to 70 cents an hour. In case additional teams cannot be had, one of the trucks is sometimes sandwiched in to do the work in the horse territory, where it is equivalent to three two-horse teams. If all deliveries were made by horses to the 4-mile zone, or approximately 8 miles to the round trip, one truck would replace five or six double teams.

A Waterborne Plant

Besides being distinguished for putting into operation the first motor truck used in the coal trade in Pittsburgh, the Second Pool company also has an unusual main plant which is entirely waterborne on the Allegheny River. This plant consists of a series of barges suitably tied together to form a homogeneous plant which rises and falls with the ebb and flow of the tide. The general lay-out of this unusual plant is shown in the perspective sketch given at the top of page 6.



One of the 4-ton Alcos being helped up the steep grade between the plant and the street by means of a cable wound up on the drum of an electric winch placed near the street level. Note the short gangplank on which the truck reaches the road from off the plant float, and how it can be raised or lowered, according to the height of the tide, by means of block and tackle and an overhead brace

The offices and storerooms of the company are situated on one of the barges, while overhead bins are placed on another. Similarly, another barge supports a revolving locomotive-type crane with a clamshell bucket which picks the coal out of the barges floated down the river and warped to the plant and places it in one or two overhead hoppers. The weighing scale is also built into a barge, on one end of which is supported a gangplank that can be raised or lowered as the tide rises and falls to permit the trucks to run off onto the river bank.

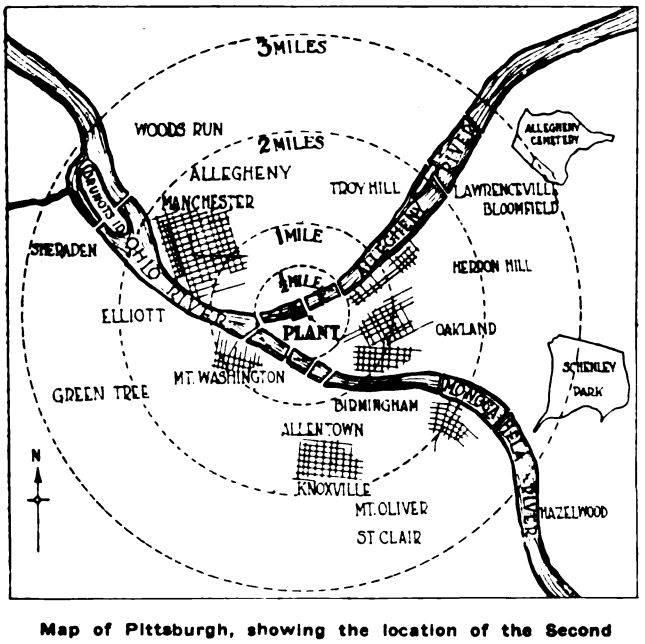
Except at times of especially high water, the entire plant is moored about 300 feet from the nearest paved street running parallel with the river edge at the top of the bank. The grade between the float gangplank and the street is approximately 22 degrees, which is more than a heavily laden truck can negotiate without outside assistance. This is provided in the form of a small 25-hp. electric cable hoist, which pulls the truck approximately three-fourths of the way up the grade, at which point the road turns parallel with the paved street so that the vehicle can then proceed under its own power.

The three trucks are maintained in a public garage at the rate of $22 per month, which provides for washing and polishing once a week. Minor repairs and inspection are performed by the truck drivers, leaving the major repairs to the Alco agent in Pittsburgh.

The drivers are former coal-wagon drivers which have been retained because of their knowledge of the trade. They are paid at the rate of $3.25 for a 10-hour day. The helpers used on the trucks are paid $2.75 a day, and both drivers and helpers are paid straight time for work after regular hours.

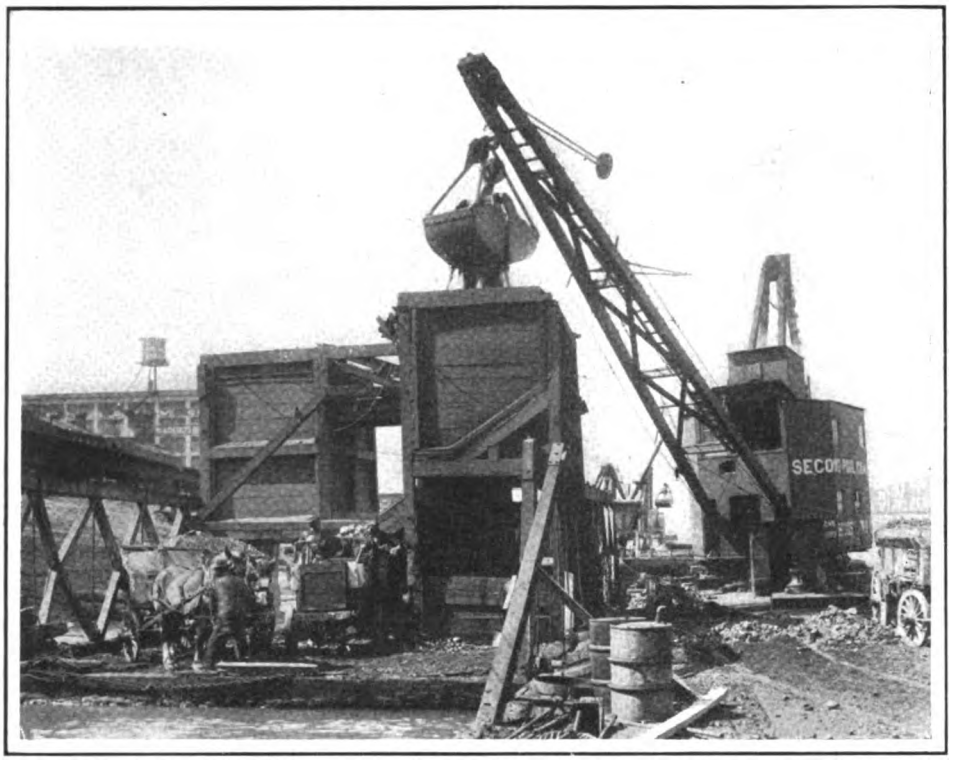
Although detailed cost figures are not available, the officials of the Second Pool company state that their trucks cost on an average of $18 per day per truck. This figure includes all items such as the fixed charges of interest on investment, depreciation, taxes, licenses and insurance; maintenance charges of tires, repairs, overhaul and garage rental, and operating charges, such as gasoline, oil, kerosene, waste, etc., drivers' and helpers' time, mechanics' time and miscellaneous expenses.

Each truck is credited with $18 per day for total operating expense as a part of the delivery cost of the coal. If it earns more or does more than $18 worth of work the excess amount is credited as profit on the operation of



Map of Pittsburgh, showing the location of the Second Pool Coal Co.'s plant on the Allegheny River, and the four delivery zones. Approximately 75 per cent of the company's 400-ton daily output of coal is delivered in the business section of the city proper, all within the ½-mile zone of the plant. Horses are used for this work, leaving the trucks for the deliveries to be made farther away from the plant

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Close-up view of the two overhead loading hoppers, showing the crane unloading the coal into them from the barges alongside the float, and one of the trucks being loaded. The trusses along the sides of the barge on which the hoppers are placed are to prevent the float from sagging on account of the concentrated weight

the truck as compared with making the delivery by horse wagons.

Due to the keen competition among coal dealers in Pittsburgh, because of their large number and their well-scattered locations, most of the companies determine the selling price of coal for the domestic trade on the zone system according to the length of haul from the plant. Approximate figures, which are constantly changing from month to month or even week to week, for the various zones are as follows:

Zone	Approximate Price Per Ton
½-mile	$4.75
1-mile	5 00
2-miles	5.25
3-miles	5.00
4-miles	4.75

It will be noted from the above approximate figures that the cost of delivery in the ½-mile zone and in the 4-mile zone is equal. That this is the case is due partly to the fact that the trucks haul more cheaply to the 4-mile zone than do horses in the ½-mile zone and partly to meet the competitive price of the local dealer located within the 4-mile zone.

One other characteristic of the Second Pool company's trucks which has not yet become common in the trade is their white bodies. The unusualness of carrying a product which soils so easily as coal in bodies painted white enables the bodies to become advertising mediums in that they always attract the attention of pedestrians. Besides, the black and white contrast is pleasing to the eye and the bodies wash easily. Another important advantage of the white coal body is that when clean it at once proclaims to the customer or pedestrian the care given the vehicles and the delivery service in which they are engaged.

Our London Letter

By R. Douglas-Vickers

LONDON, ENG., June 15—In view of the fact that many of your truck-making firms have interested themselves in military transport vehicles, it may be worth while referring to two American-built vehicles that have done well on this side and in some of the war zones during the past 2 years or so. I say two, although I know a variety of other makes have been successfully employed in difficult transport undertakings, for the reason that they have come under my notice particularly during the last few months. They are the Pierce-Arrow and the Jeffery Quad, both now well known to motor transport experts in this country. I had a conversation with an official connected with a fleet of about 300 Pierce-Arrow trucks and he assured me that no finer outfit existed in England to-day than these trucks. This view is pretty generally indorsed by well-informed men in the business.

As to the permanence of this impression, and its possible future effect upon sales in this country, one has got to remember that in price it is one of the most expensive trucks built in the United States, and cost here about $5,250 apiece, a price in excess of what quite the best British trucks of the same load capacity are sold at. Pierce-Arrows were quite unkown here before the war and those that have been brought in during the past 2 years have had to bear very heavy freight charges. If there was any advantage in price this is the type of commercial vehicle that would sell very freely in this country after the war.

The Jeffery Quad is another truck that may be heard of to a greater extent after the war, especially if commercial and manufacturing concerns go in more extensively for the use of trailers than they have done in the past.

The possible increase in the use of trailing vehicles is a development which has not, so far as we in England are concerned, had the attention it deserves. The heavy trucks that are so extensively employed here are not made in all cases for trailer work, although this is not true of British-built steam trucks. In nearly every instance they are used to haul trailers in the several industries in which they are employed, including the textile, flour-milling and furniture-moving business. Some thousands of firms are concerned in each of these industries and if the advantages of the four-wheel drive for trailer work were properly put before them, I believe that they would ultimately be found among the patrons of this system. Contractors have often spoken of the difficulties they have frequently encountered on soft country lanes, where much of their work is done, through the wheels sinking in the roadways. The difficulty is one that the four-wheel drive is especially calculated to obviate, and I feel certain that it is now bound to be more carefully considered than hitherto.

Furniture movers in nearly every case want trailers. So do flour mills, but I do not as yet know of any of them who make use of a Jeffery Quad or an F. W. D. truck, a make seen occasionally on the roads here. Where I think four-wheel-driven trucks are likely to find much favor in the future will be in Australia, South America and Russia, where the roads are very much inferior to what they are in the United Kingdom. Russia is more than likely to be a good market for all kinds of trucks, and builders on your side would be well repaid in studying Russian needs very closely. Italy may become a rather formidable competitor after the war, for it is well known here in London that the F. I. A. T. company of Turin is making plans to produce commercial vehicles in enormous quantities after the war. Its present production is between 15,000 and 20,000 machines per year, but this will naturally be reduced as the factory reverts to its production of passenger car chassis.

Reverting to the subject of the four-wheel-drive system, it may interest you to know that several firms here are giving it their attention. I understand that the British Commercial Lorry Co. of Manchester has a new chassis on this principle, but I am unable to say whether or not it is to be put on the market at once.

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Self-Contained Elevating Coal Body on Trailer

Raised and Lowered by Air-Cooled Engine

MOUNTED on a reversible four-wheeled trailer, the elevating steel coal body shown on this page is novel in that it is raised and lowered by means of a special small gasoline engine mounted on the trailer frame. The outfit is thus in a unit by itself because the body can be raised and lowered without any assistance from the truck which hauls it.

In the past there have been several designs of elevating trailer bodies which were raised and lowered by the aid of either hydraulic, pneumatic or mechanical means, but all of these have required that the truck remain connected up with the trailer in order that the power might be transferred from one part of the outfit to the other.

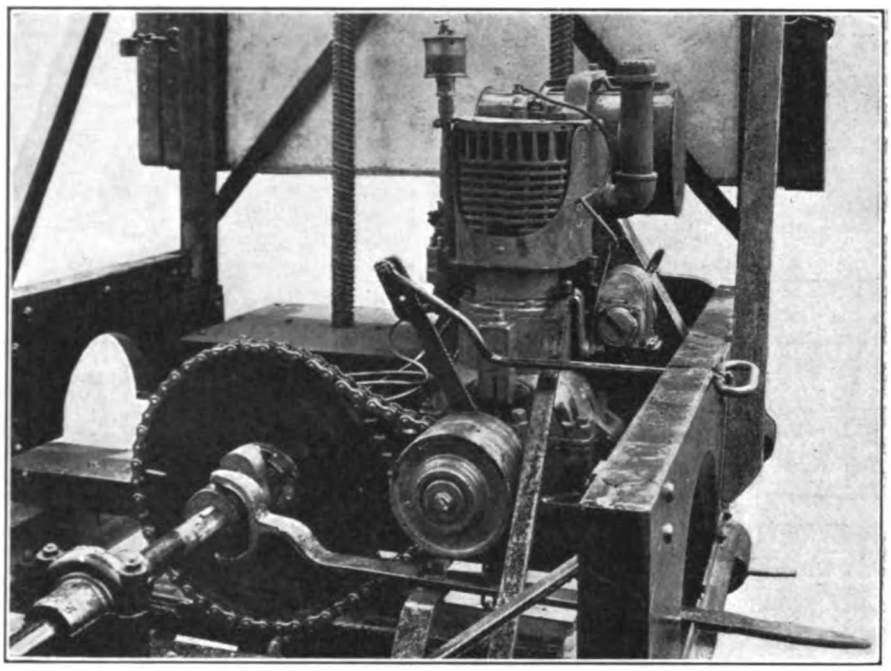
The design and details of the unit shown herewith were originated and worked out by C. H. Quereaux, manager of the Troy Trailer Sales Co., New York City. The trailer on which the body is mounted is a 5-ton reversible type as manufactured by the Troy company and will be used behind a 5-ton Packard truck owned by the C. W. Munson Farm at Roslyn, Long Island, N. Y.

The body, made by the Thomas Wright Co., Jersey City, N. J., is elevated by means of four-screw-hoists, two at each end of the body. The two screws at each end of the body are revolved at the same speed by means of suitable gearing and a longitudinal shaft extending from one end to the other. The small one-cylinder gasoline engine drives the longitudinal shaft through a chain-and-sprocket system, as shown in the detailed view on this page. The engine is of the New Way air-cooled type and is of 4 hp.

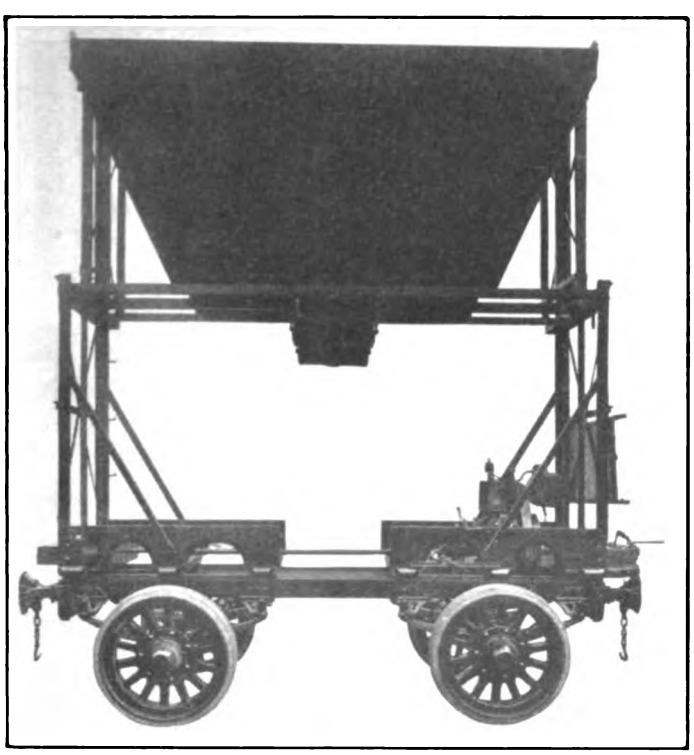
The body may be elevated for the full height of 7 ft. off the trailer frame in less than 1 minute's time. In this position it is easy to chute the coal from special pockets on each side of the bottom of the body to almost any desired location.

The body is perpendicular on each side, but the ends are slanted off from the top toward the bottom to provide for the flow of coal by gravity. As shown, the air-cooled gasoline engine is mounted on one end of the trailer frame without interference with the body due to its shortened length at the bottom.

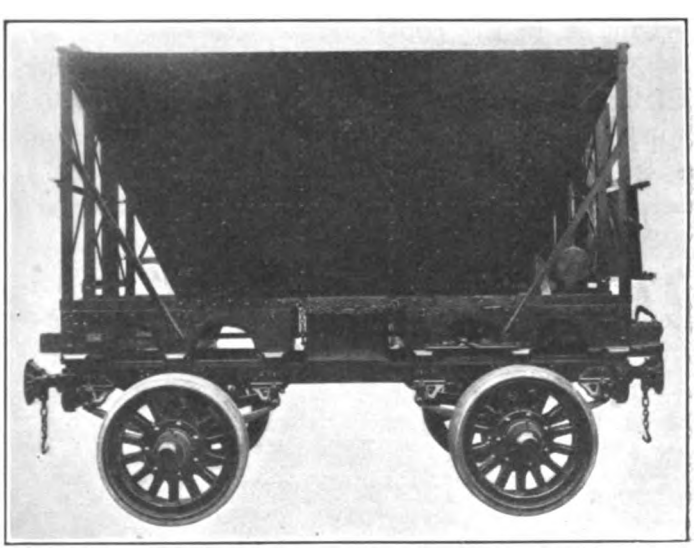
The conventional steel chutes of the telescopic type are pushed together and carried on hooks on the front end of the body framework.



Close-up of the single-cylinder, air-cooled New Way engine, showing the chain drive to the longitudinal shaft by which the end screw hoists are revolved



The body may be elevated to its full height of 7 feet above the trailer frame in less than 1 minute's time. The chutes are carried at the front



The body in its lowered position. Note how the slanted forward end makes it possible for the engine to extend above the frame without fouling

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The Truck's Opportunity

THE entrance of the United States into the war should prove a blessing in disguise for the American motor truck user, maker and dealer. Following in the footsteps of our foreign Allies, our own government will make large purchases of motor trucks for all branches of the war-making service, such as the army and navy departments, signal, aviation and medical corps, etc.

But more important than this temporary war work, although of course it is the most pressing and must be attended to first, are the vast benefits and opportunities accruing to the commercial truck user in handling the other products which enter into the manufacture of articles for successfully carrying on the fight.

Many of the railroads will reduce the number of passenger trains in order to more effectively handle long-distance freight and troops. This will offer a great opportunity for the motor truck to step in and work in conjunction with the railroads on what they now consider short-haul shipments of 50 to 100 miles or even longer. While many trucks have entered this service since the outbreak of the war in August, 1914, the entrance of the United States and the great amount of war preparation since that latter date have placed additional loads upon the railroads such as they cannot effectively meet without the aid of the motor truck.

In these days of crisis, when the greatest efficiency must be shown by every individual and corporation as well as the government, it behooves us to use the most efficient means of vehicular transportation—the motor truck. If you have hauling to do, do it by truck.

How Many Trucks Are There in the United States?

IT is a sad commentary on the way things are handled in the United States that no one can say positively just how many motor trucks or commercial vehicles there were in this country at any stated time or are in use to-day. This condition of affairs has existed since the motor truck first became an indispensable link in the world's transportation. It is high time that it was remedied.

It is indeed fortunate that America did not find herself in the position of France at the outbreak of the war when Uncle Sam decided to cast his weight into the balance against the Teuton. For if she had, who would there have been to say how many trucks we had, of what size and capacity and where they could have been found?

According to figures just issued by the government, it has a record of only 118,682 trucks in service in this country on Jan. 1, 1917. There were almost three-fourths that many trucks made and put into service in the United States in 1916 alone, to say nothing of the number in use at that time that were built several years previous.

Of the forty-eight states and the District of Columbia, only nineteen have records of the number of motor trucks in use, and the government figures in five of these nineteen are estimates!

Reliable approximations of the number of trucks actually in use on Jan. 1, 1917, place the number at close to 198,000, as reported in the issue of THE COMMERCIAL VEHICLE of that date.

It is hoped that the entrance into the war on the side of the Allies will result in many lasting benefits to the people, industry and life of the United States and it is hoped that one of these will be a sensible registration of motor trucks throughout every state of the Union.

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Fix New Truck Rates In Connecticut

Highway Commissioner May Restrict Vehicles Over 4-Ton Capacity

HARTFORD, July 9—Higher rates and added restrictions were placed upon commercial vehicles in the new traffic law which went into effect in this State on July 1. The fees for commercial vehicles are now $11 for capacity up to 1000 lb., $15 for a 1-tonner, $5 for each additional half ton up to 4 tons, then a progressive increase so that the charge is $75 for a 5-tonner, $100 for a 6-tonner, $125 for a 7-tonner, $200 for an 8-tonner, and $100 for each ton or fractional part thereof above 8 tons.

The power to restrict the use of trucks is also placed in the hands of the highway commissioner, who may prohibit or limit the passage of trucks exceeding 4 tons capacity in using any trunk line or State aid highway. A vehicle which with its load exceeds 25,000 lb. may not use a Connecticut road except by obtaining a special permit from the highway commissioner which will define exactly the extent and circumstances under which the vehicle may operate.

A schedule of speed limits for trucks is also provided: A vehicle which with its load exceeds 4 tons in weight must not travel over 15 m.p.h.; if such vehicle is equipped with hard rubber tires or tires of similar substance it must not travel over 12 m.p.h., and trucks having a gross weight with their load in excess of 12,000 lb., if equipped with metal tires, shall not exceed 6 m.p.h.

No commercial vehicle wider than 9 ft. 6 in. over all shall be operated without a special permit. The commissioner is the authority for determining the actual maximum carrying capacity of the truck regardless of the horsepower.

The schedule of truck fees for commercial vehicles in Connecticut is as follows:

Carrying Capacity	Annual Fees
Up to 1000 lbs.	$11.00
1 Ton	15.00
1½ Ton	20.00
2 Ton	25.00
2½ Ton	30.00
3 Ton	35.00
3½ Ton	45.00
4 Ton	55.00
4½ Ton	65.00
5 Ton	75.00
5½ Ton	87.50
6 Ton	100.00
6½ Ton	112.50
7 Ton	125.00
7½ Ton	150.00
8 Ton	200.00

METZ CHASSIS FOR SMITH FORM-A-TRUCK

BOSTON, MASS., July 9—John L. Judd, who has the New England distribution for Smith Form-A-Truck attachments and the Allen and Auburn car, has secured an option on Metz cars to be used with Smith units for making trucks. The new Metz for this work has a three-speed Warner transmission instead of a friction drive. This will give Mr. Judd the entire United States for his territory with the combination. He also has the U. S. territory for an Allen Smith Form-A-Truck attachment.

109 MEMBERS IN N. A. C. C.

NEW YORK, July 9—With the election to membership of the Service Motor Truck Co. of Wabash, Indiana, at the last meeting of the board of directors, the membership of the National Automobile Chamber of Commerce now includes 109 complete vehicle manufacturing companies. Forty-three of the members manufacture commercial cars.

FAGEOL NEAR PRODUCTION

OAKLAND, CAL., July 11—Work is being rushed on the Fageol factory here for which ground was broken early in June, as announced in the previous issue of THE COMMERCIAL VEHICLE. Fageol will produce a line of trucks having 1-, 2-, 3-, 3½- and 5-ton capacities, with uniform main specifications and 12-ft. wheelbase. Waukesha four-cylinder 4¼ by 5¾ engine will be used.

PIERCE-ARROW PROFITS $1,341,132

NEW YORK, July 7—A net manufacturing profit of $1,341,132 is reported by the Pierce-Arrow Motor Car Co. for the four months ended April 30. This is after all taxes, except for excess profits, and after allowing for interest and $156,444 depreciation.

FISK ACQUIRES GIBNEY ASSETS

CHICOPEE FALLS, MASS., July 10—The Fisk Rubber Co. has bought the assets of the Gibney Tire & Rubber Co., Conshohocken, Pa., and will continue the manufacture and marketing of solid tires as a branch of the Fisk organization. Fisk solid tires will be sold through Fisk branch houses and the branches established by Gibney.

WILSON BODY CO. ISSUES BONDS

DETROIT, MICH., July 10—In order to care for notes now maturing and to provide capital for expanding business the C. R. Wilson Body Co., one of the largest vehicle body makers in the country, has issued $1,000,000 6 per cent bonds.

HEWITT INCREASES CAPITAL

BUFFALO, N. Y., July 11—The Hewitt Rubber Co. has increased its capital from $1,000,000 to $1,500,000 in order to expand the tire department of its business.

Save Money
Make Money

See Pages 26 and 27

New Delivery System In Boston

Big Retailers Adopt Plan Predicted in The Commercial Vehicle

BOSTON, MASS., July 14—The big retail stores of Boston at the request of the Boston Chamber of Commerce have adopted a new delivery plan which does away with the night work and late hours of the drivers of its motor and horse-drawn vehicles. Now all goods bought before noon each day are delivered during the afternoon or before 7 o'clock in the evening. Anything bought after that time is not delivered until the next morning.

This action was forecast in the June 1, 1917, issue of THE COMMERCIAL VEHICLE by J. V. Finn, of the Jordan-Marsh department store.

NEW PRICES ON UNITED TRUCKS

GRAND RAPIDS, MICH., July 11—The United Motors Co. has increased the prices on the worm-driven trucks. The 2-tonner has been increased from $2,250 to $2,350; the 3½-tonner, from $2,900 to $3,150; the 4-tonner, from $3,200 to $3,450; the 5-tonner, from $3,900 to $4,250. No advance has been made on the tractors.

The tractor production is now in progress. One hundred tractors will be produced this month. Two hundred a month production will be maintained commencing Aug. 1.

RAILWAY TO RUN JITNEYS

LOS ANGELES, CAL., July 9—After leading a State-wide fight against jitney buses the Pacific Electric Railway Co., the great interurban system of southern California, is going into the jitney business itself. It already operates motor bus lines in Sacramento, Stockton, Fresno and Santa Barbara, and it has applied for licenses to operate feeder routes along the main electric line of the railway.

REYA ABSORBS NAPOLEON TRUCK

NAPOLEON, OHIO, July 7—A new truck company has been organized to take over the truck end of the Napoleon company. The Reya Co. has been organized, with a capital of $800,000, financed largely by Eastern capital, and is now building a light special truck. The company will also build a 1-ton and a 1½-ton attachment. The following officers have been elected: President, J. J. Mullan, Wheeler Mfg. Co.; vice-president, Charles Lang; vice-president, L. W. Schultz, who is vice-president of the First National Bank, Napoleon, Ohio; secretary, W. W. O'Hara; general manager, M. H. Ayer; treasurer, J. W. Gates, New York. The Reya truck will have 3¾ x 4½ engine, Dyneto electric lighting and starting system, Dixie magneto, Peru axle, 117-in. wheelbase, Babcock special bodies.

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Will Establish Army Truck Depot

War Department to Locate Station Near Richmond, Va.

WASHINGTON, July 7—A large truck supply depot is to be established by the War Department at a point somewhere between Richmond and Norfolk, Va. This depot will be used primarily for the storage of motor vehicles and equipment destined for points abroad. It is understood that it will be one of the most important as well as one of the largest depots of the kind established anywhere in the country.

When the movement of National Guard troops to Europe begins, this depot will naturally be called upon to supply these forces with motor equipment. Also, it is probable the National Army forces will be supplied from this depot, regardless of whatever ports these forces embark from.

The plan of the department is said to be to maintain a force of mechanics here, prepared not only to assemble parts of motor machines for shipment abroad, but also to make necessary repairs to machines which have seen service in the various training camps.

U. S. MAY HELP TO FINANCE WAR ORDERS

WASHINGTON, July 9—Secretary Daniels has sent to Congress a resolution urging that permission be given the Government to aid contractors in financing the operations necessary in filling the war orders. This at present is against the law, and the request is made that permission to advance public moneys be given only for war emergency. The limit of money which may be advanced under this resolution would be 30 per cent of the contracts.

TRUCK FACTORY EMPLOYEES PROBABLY EXEMPT

WASHINGTON, July 10—It is believed that all employees of automobile and truck factories will be exempt, although each one so exempted will have to appear before the exemption boards. While there will be no exemptions from the draft as to classes, except those specifically exempted by the President, the United States will sift out and exempt from fighting service employees of munitions plants, shipbuilding plants and practically every branch of the industries that aid, directly or indirectly, in maintaining the military forces.

WAR DEPARTMENT NEEDS FORD BLAST FURNACES

DETROIT, July 9—The immediate development of the River Rouge to enable boats to reach the proposed new Ford blast furnaces has been recommended by Secretary Baker as a war necessity.

The secretary of the war department mentioned the importance of the tractor as a means of increasing food production in connection with the river improvement, but pointed out specifically that the saving in transportation is a feature which makes this work imperative. He also stated that the Ford process of turning raw iron into finished cars and tractors, practically in one plant, will allow the use of vast transportation facilities for other purposes.

BUICK PREDICTS BIG COAST BUSINESS

PORTLAND, ORE., July 9—Big business for motor vehicles on the Pacific Coast is predicted by Buick distributors here. Everything favors the motor truck dealer. The lumbering and grain people have had three years of unexampled prosperity. Since they are in the production of raw materials the war cannot hurt but will rather aid them. The economy cry cannot be raised against the motor truck, because it is demonstrably poor economy to part with a motor truck where needed.

TAYLOR TAKES OVER BURFORD

FREMONT, OHIO, July 7—The Taylor Motor Truck Co. with a capital of $1,000,000 has been formed and will take over the Burford Motor Co. here. Stockholders of the company include R. E. Taylor, who was formerly with the Gramm Motor Co. of Lima, Ohio; Robert Willoughby of New York City, and B. H. Sheehan, L. A. DeRan and B. H. Weinhart of Fremont.

TOWER INCREASES CAPITAL

GREENVILLE, MICH., July 11—The Tower Truck Co. has increased its capital from $50,000 to $100,000, and will sell stock to the public.

DENMAN A MAJOR

BOSTON, MASS., July 9—Walter M. Denman, New England sales manager of the Brockway Motor Truck Co., has received a commission as major in the Engineers' Section, O. R. C. Before Major Denman joined the Brockway company he was a civil engineer specializing in concrete bridges.

Coming Events

July 17.....Newark, N. J., Monthly Meeting of the Motor Truck Club of New Jersey, New Jersey Automobile Club, 22 Washington Place.

July 18.....Philadelphia, Pa., Monthly Meeting, Motor Truck Assn. of Philadelphia, Hotel Adelphia.

Aug. 12.....Sixth Annual Outing of the New York Division of the Motor Truck Club of America at Karatsonyi's Hotel, Glenwood Landing, L. I.

France to Bar Truck Importations

Decision Effective on Orders Planned After July 1

WASHINGTON, D. C., July 9—Word has been received from the American Consul General in Paris that France has barred the importation of trucks. The minister of armament and war material published a decision on July 1 stating that no more permits for truck imports would be granted unless the manufacturer could produce evidence that the shipments had actually been started toward France before the date of the decision. This news is an important factor in the truck export market, since France has been one of our best customers in the past two years.

AMENDMENT DEFINES NEW YORK TRUCK LAW

ALBANY, July 9—No vehicle which has not been especially designed for commercial purposes shall be made to pay the special fees exacted by the State from motor trucks. When the commercial vehicle rates were made effective a number of persons were arrested for carrying baggage and produce in passenger cars, operating under a passenger license. The question then arose as to what constitutes a commercial vehicle, whether a passenger car used for commercial hauling, though not designed for the purpose, must pay the higher rates. An amendment to the current law which provided that the passenger car owner need not be penalized for using his vehicle for carrying products if he so desired was passed by the Legislature, and some time later signed by the Governor.

REPUBLIC ACQUIRES KNIGHT TIRE OPTION

DETROIT, July 11—The Republic Rubber Co. has acquired an option on the controlling interest in the Knight Tire & Rubber Co., which is held by Thomas L. Robinson, Guy E. Norwood and John T. Harrington. Plans are for a new corporation with capital of $20,000,000. The Knight factory is to be greatly enlarged and in part immediately devoted to the construction of Republic tires.

50,000 FORD TRACTORS FOR ENGLAND

DETROIT, July 11—Charles E. Sorensen, arriving from England to-day, states England has contracted for 50,000 Ford tractors annually.

CRESCENT TO MAKE DELIVERY CAR

NEW YORK, July 9—The Crescent Motor Truck Co. has been incorporated to enter the market with a 1500-lb. delivery car, to be an assembled proposition selling around $1,000.

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Fifth Avenue Coach Erects Factory

Company Formerly Used De-Dions—Plant Acquired

NEW YORK, July 8—War conditions have forced the Fifth Avenue Coach Co. to go into the manufacture of its own trucks. This company has acquired property at 132d Street and Broadway for the erection of a four-story plant for the manufacture of motor buses. The proposed plant is estimated to cost about $1,000,000.

The company has already assembled about sixty of its new trucks, and is planning to produce 200 in all, under its own specifications. The Moline-Knight engine will be continued with certain modifications.

Before the war started the company imported hundreds of buses from France, the majority of them being De Dions. Since then through its engineers it has designed its own trucks and is assembling them with parts of its own design.

ARMLEDER CUTS DRIVE-AWAY COSTS

CINCINNATI, OHIO, July 6—Because of freight embargoes around Cincinnati the Armleder company has found drive-aways from the factory necessary in order to get the trucks to the buyer. To reduce the extra cost which this entails the company has entered into the freight relief business. If the customer is willing the company often secures a load of freight from Cincinnati which is destined for the home town of the customer, thereby wiping out the drive-away costs by the freight tolls received

TITAN NOW HINCKLEY

DETROIT, July 7—The Titan Motors Corp., organization of which was recently announced in the COMMERCIAL VEHICLE has changed its name to the Hinckley Motors Corp. The change is made because it was found that the name Titan has been previously used. The company will first devote its activities to the manufacture of army truck motors.

UNITED AND LAMSON MERGE

CHICAGO, ILL., July 10—The Lamson Truck & Tractor Co. has merged with the United Four Wheel Drive Co.

RECORD BUSINESS FOR WILLYS-OVERLAND

NEW YORK, July 8—All previous retail sales records were broken by the Willys-Overland Co. in June, when it registered a business of $11,150,000. This figure is for the United States alone and does not include Canadian and export sales. On June 25, 1075 cars were sold at retail, $998,200 worth, a new high mark for a single day's Overland retail sales. From one-fourth to one-sixth of the total retail sales in June were made in the Eastern district.

During the first 2 weeks in June daily retail sales averaged $400,000, which increased to $450,000 during the week of June 17, and from June 25 to June 30 the daily average was in excess of $500,000.

GUARANTY TRUCK PRODUCTION STARTED

CAMBRIDGE, MASS., July 1—Samuel W. Prussian has begun the manufacture and delivery of the new Guaranty trucks he has designed by using an attachment which may be adapted for Fords and other passenger cars. He has formed the Guaranty Motors Co. of Cambridge, and leased a plant at Brighton, a suburb of Boston, for production. In addition to the new unit he will build a complete truck also. There are several of the units in use now. A retail salesroom has been opened on Boylston Street, Boston.

GLOBE, NOT GROVE

NEW YORK, July 15—In the complete bids for army motor trucks printed in the June 15 issue of THE COMMERCIAL VEHICLE, page 15, the Grove truck referred to should have been Globe, and the Henney should have been Hannay.

RUSSIA HAS 1200-MILE TRUCK ROUTE

NEW YORK, July 9—Long distance motor truck hauls are solving the Russian railroad difficulties. There has been organized a 1200-mile transport route between Petrograd and Archangel. A month is required for the trip, and about twenty trucks start each day from each end of the line.

Truck Profits Depend on Good Repairs

See Pages 26 and 27

3780 More Trucks In Massachusetts

50 Per Cent Gain Over Last Year in Bay State

BOSTON, MASS., July 7—The best evidence that the business men find the motor truck a necessity is brought out by the figures just made public by the Massachusetts Highway Commission for the first six months of this year. It shows that while there has been an increase of vehicles over the total of all last year, the larger number listed were commercial machines. In other words, while 6042 more vehicles were placed on the registration list for the first six months of 1917 than all the machines listed in 1916 there were 3780 trucks and 2262 cars. Practically two-thirds of the increase therefore was made up of commercial vehicles. Last year there were 117,615 cars and 18,194 trucks registered for the entire year. That was a total of 136,809. The first six months of this year shows 120,877 cars and 21,974 trucks, or a total of 142,851 vehicles. For the first six months of 1916 there were 14,800 trucks listed, so a comparison with the same period of this year shows 7174, or nearly 50 per cent more commercial vehicles listed than the previous year. Here are the figures for the comparative periods:

	Trucks	Cars	Gain Trucks	Gain Cars
1st 6 Mon., 1916	14,800	90,688	....	....
Entire Year, 1916	18,194	117,615	3,394	26,927
1st 6 Mon., 1917	21,974	120,877	3,780	2,262

SMITH FORM-A-TRUCK BOOMING

CHICAGO, ILL., July 11—Seventeen thousand Smith Form-A-Trucks are said to have been delivered by the Smith Motor Truck Co. during the first 6 months of this year. The 1917 production figure is expected to reach 40,000.



THIS TRUCK RUNS ON 1540-MILE HAUL

One of the first illustrations published of the 5-ton Packard truck owned by the Goodyear Tire & Rubber Co., which has already made four round trips between Akron, Ohio, and Boston, Mass., a distance of 1540 miles. As shown, the truck is mounted on giant pneumatics, both front and rear, and has been running on a regular railroad schedule over set routes covering the eastern branches of the Goodyear company and taking cotton fabric back to Akron from the Goodyear cotton mills, Goodyear, Conn.

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May Borrow on Truck Accounts

Plan to Finance Dealer and Manufacturer

NEW YORK, July 10—A financial plan operated by the Acceptance Corp., New York, to advance money on open accounts, may be used by truck manufacturers, dealers or distributors where the accounts are not closed by notes and are against good concerns. The acceptance plan is normally used where the merchant or manufacturer has made a sale on open credit terms such as 60 days. The account is assigned to the Acceptance Corp. under terms arranged at the time. The borrower gives permission, if he desires, for the corporation to approach the client with the object of obtaining from the purchaser a trade acceptance to cover the transaction. The acceptances are then taken to the bank, discounted, and the proceeds of the discount placed to the credit of the borrower's loan from the corporation. The service rendered by the corporation is that it handles a larger volume of business than the individual, and may therefore be able to get better bank terms, and that it conducts the machinery of getting the client to sign a trade acceptance.

MORE AMBULANCE UNITS FOR FRANCE

PARIS, July 9—The American Field Ambulance Corps is planning to develop two new important branches of its work, namely, first to form a military transport service, and second, a military school, at which the Americans will receive special training under French officers.

The Americans will have charge of the transportation of ammunition and field supplies at the main points where offensives are in progress, according to plans. It is hoped that the special military training will lead to appointment as officers of the French army after a few weeks of intensive training.

The first section of the transport service leaves next Wednesday, composed of forty-five Americans with twenty ammunition trucks.

The development of these two new branches of work will probably lead to a change of the name to the American Field Service or American Volunteer Corps.

PEERLESS SHIPS 80 TRUCKS WEEKLY

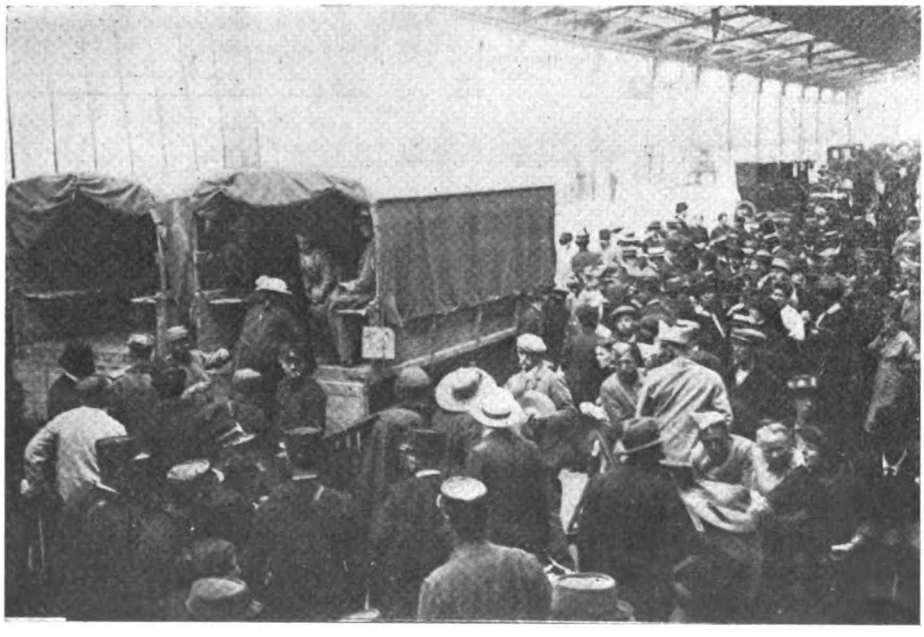
CLEVELAND, July 9—The Peerless Truck & Motor Corp. has shipped eighty trucks a week since Jan. 1, breaking all previous records for the company.

TRUCK CLUB OUTING AUG. 12

NEW YORK CITY, July 13—The sixth annual outing of the Motor Truck Club of America will be held at Karatsonyi's Hotel, Glenwood Landing, L. I., on Sunday, August 12. This is the first time in the history of the Club that its outing has been held on a Sunday. It will be a full day's outing this year instead of half a day as formerly. The trip from New York City to Glenwood Landing and return will be made on a private boat. Greater details will be published in the next issue.

Maintenance Hints Worth Money

See Pages 26 and 27



Motor trucks are being used as trains de luxe by the French people arriving in Paris from the sections recaptured from the Germans. Although these vehicles do not provide the comforts of a Pullman, they travel the necessary distance in the necessary time, and to anyone who has been living in No Man's Land between the firing lines, that is indeed an adequate service

Mexico Lifts Tariff On Trucks

Proposed Taxation Repealed —Trade Stimulated

LAREDO, TEX., July 10—As a result of strong protest on the part of motor vehicle dealers of Mexico, the federal government of that country has revoked that part of its import taxation decree which placed an import duty of 60 cents Mexican gold per kilo of 2.20 lb. on motor vehicles. This duty was to have gone into effect July 1 and the knowledge that the heavy tax was to be imposed caused a great rush of shipments of commercial and other cars into Mexico from the United States during the months of May and June.

The duty would have been practically prohibitive, as it meant that a car or truck weighing 1000 lb. would have had to pay import duty amounting to $450 Mexican gold, which is about $225 American money. The larger and heavier vehicles would have had to pay a still greater amount of duty, and this would have made them too high priced to sell in Mexico.

Now that the import duty has been entirely removed, it is expected that there will be built up a large trade in American trucks in Mexico. New garages and salesrooms are being opened in all of the larger cities and orders are being placed for many new commercial vehicles.

AMERICAN DOCTORS IN FRANCE

WASHINGTON, D. C., July 10—The United States will send 3000 ambulances and 7700 doctors and drivers to France, the Council of National Defense announced recently. The first unit of twenty-two ambulances and seventy men will leave within a week. This is in addition to the six medical units, comprising about 1000 medical men, which will be sent at once to Great Britain.

CALIFORNIA JITNEYS EARN $3,000,000

LOS ANGELES, CAL., July 9—At a meeting which members of the California Electric Railroad Association held in Sacramento, statistics were presented to back up the claim that the railroads have lost $3,000,000 in revenues during the past year by reason of the competing jitney buses and private automobiles.

The railway officials estimate that the motor vehicles carried 60,000,000 passengers. The total earnings of the electric railway systems represented at the meeting were $35,000,000.

LIGHTHOUSE INSPECTOR USES PIERCE-ARROW

TOMPKINSVILLE, N. Y., July 3—After competitive bidding by five different makers, the Harrolds Motor Car Co., New York Pierce-Arrow distributor, placed an order for a 5-ton truck to be used by the lighthouse inspector of the Third district.

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Up-to-the-Minute Motor Truck Price List Shows Many Increases

With Few Exceptions All Trucks Now Cost More— Table a Ready Guide for Owner, Maker and Dealer

PRICES of motor trucks have been steadily increasing since January 1 last, as is shown in the accompanying table, which gives the prices of a large number of trucks offered on the American market. There are three or four exceptions where the prices have decreased slightly, but these are so few in comparison with the number increased as to be practically negligible in the upward trend in truck costs since the beginning of 1917.

These increases in truck costs have been due to the labor market or to the shortage in materials or to a combination of conditions in both fields. In any event, the raises in prices have come with such frequency of late that even some of the prices published here may be superseded by other higher ones before the month of July is out.

War conditions in this country since Uncle Sam decided to throw his weight in the balance against the Teuton, and the shortage in many of the materials used in truck construction occasioned by the use of such materials for munition purposes, have also no doubt been reflected in the present truck prices. As long as the present unsettled industrial conditions exist generally throughout the country, it is hard to say just at what point the price increases will stop, for there seems to be a general tendency to raise the price of everything we eat, wear or use in our business.

For the purpose of rendering a tangible service to the owner, maker and dealer in keeping them informed of the last-minute truck prices, THE COMMERCIAL VEHICLE publishes the following table, in which are given the model number, capacity in pounds, old price, new price and difference in price as compared with that as published in the specification issue of November, 1916. The names of the makes are arranged alphabetically for easy reference.

Name and Model	Capacity in Lbs.	Old Price	New Price	Increase in Price
A&B 3T	6,000	$4,500	$4,500	....
A&B 5T	10,000	4,750	4,750	....
Acason 2	4,000	....	....	....
Acason	7,000	....	....	....
Acme ..... B	2,000	1,500	1,650	150
Acme ..... A	4,000	2,100	2,300	200
Acme C	7,000	....	3,100	....
Armleder HW2	4,000	2,800	2,750	†50
Armleder ..... KW	7,000	3,500	3,600	100
Atlas 17	1,000	690	690	....
Atterbury 6B	2,000	1,775	....	....
Atterbury 6R	3,000	1,875	2,275	400
Atterbury 6C	4,000	2,375	2,675	300
Atterbury 6D	7,000	3,175	3,575	400
Autocar 21F	4,000	1,650	1,815	165
Available 1	2,000	1,700	1,775	75
Available. 2	4,000	2,250	2,450	200
Available. 3	7,000	3,300	3,450	150
Available. 5	10,000	4,400	4,500	100
Avery C	2,000	1,690	....	....
Avery. ..... B	4,000	2,700	2,700	....
Avery. ..... B	6,000	3,200	3,200	....
Avery ..... A	6,000	2,500-c	....	....
Avery ..... B	10,000	4,500	4,500	....
Barker	2,000	2,000	2,000	....
Barker	4,000	2,400	2,400	....
Bell	1,200	580	580	....
Beech Creek	6,000	3,850	....	....
Bessemer ..... G	2,000	975	1,250	275
Bessemer ..... D	4,000	‡2,200	2,200	....
Bessemer ..... J	4,000	....	1,985	....
Bessemer ..... E	7,000	3,100	3,100	....
Bessemer ..... H	10,000	3,600	....	....
Bethlehem	2,500	....	1,245	....
Bethlehem	2,500	....	1,285-c	....
Bethlehem	4,500	....	1,775	....
Bethlehem	4,500	....	1,840-c	....
Blair C	4,000	2,850	2,850	....
Blair ..... D	6,000	3,250	3,250	....
Blair ..... E	8,000	3,750	....	....
Blair ..... F	10,000	4,250	4,250	....
Bourne Magnetic ..... V-M	4,000	....	3,300	....
Bourne Magnetic ..... X-M	7,000	....	4,000	....
Brinton ..... H	1,500	950	....	....
Brinton ..... F	5,000	2,250	....	....
Briscoe 4-24	1,000	625	675	50
Brockway ..... O	2,000	1,450	1,650	200
Brockway J-2	3,000	1,825	1,925	100
Brockway K-2	4,000	2,125	2,350	225
Brockway ..... R	7,000	....	3,200	....
Burford O-3	4,000	2,250	2,500	250
Burford D-3	8,000	3,600	3,650	50
Chase ..... T	1,500	....	1,500	....
Chase ..... A	2,000	1,650	1,725	75
Chase C	3,000	1,950	2,025	75
Chase ..... B	5,000	2,475	2,475	....
Chase X	6,000	....	2,800	....
Chase ..... O	7,000	3,300	3,600	300
Clydesdale 25	2,000	....	1,025	....
Clydesdale 45	3,000	....	2,100	....
Clydesdale 65	4,000	....	2,500	....
Clydesdale 90	7,000	....	3,400	....
Clydesdale 120	10,000	....	4,200	....
Collier ..... M	1,500	800	900	100
Columbia ..... E	4,000	1,750	1,950	200
Commerce ..... N	1,500	975-c	975-c	....
Commerce ..... E	2,000	1,175	1,240	65
Continental ..... FL	2,000	1,550	....	....
Continental ..... HL	3,000	1,750	....	....
Continental ..... J	4,000	2,100	....	....
Continental ..... M	7,000	3,000	....	....
Corbitt ..... E	2,000	....	1,650	....
Corbitt ..... D	3,000	2,150	2,400	250
Corbitt C	4,000	2,400	2,650	250
Corbitt ..... B	5,000	2,650	2,900	250
Corbitt ..... A	7,000	3,200	3,600	400
Corbitt ..... AA	10,000	....	4,200	....
Couple Gear	7,000	....	4,300	....
Couple Gear	7,000	....	5,600	....
Couple Gear	10,000	....	5,000	....
Couple Gear	10,000	....	6,100	....
Couple Gear	14,000	....	5,600	....
Couple Gear	14,000	....	6,700	....
Croce	1,000	825	....	....
Crowther-Duryea	1,200	600-c	....	....
Dart ..... BB	1,500	1,200	....	....
Dart ..... E	3,000	1,800	1,850	50
Dart CC	4,000	....	2,470	....
Dart CC-4	4,000	....	2,470	....
Dart L	7,000	....	3,200	....
D-E ..... J	1,500	875	875	....
D-E ..... A	2,000	1,450	1,375	†75
D-E ..... B	3,000	....	1,600	....
D-E C	5,000	....	2,250	....
Dayton chain	7,000	3,400	3,650	250
Dayton worm	7,000	3,400	3,650	250
Dayton	10,000	4,500	4,750	250
Dayton	15,000	4,950	4,975	25
DeKalb ..... E	4,000	2,100	2,100	....
DeKalb E-2½	5,000	2,450	2,450	....
Denby 12	2,000	....	1,490-c	....
Denby 13	4,000	....	2,025	....
Denby 15	6,000	....	2,525	....
Denmo 10	2,500	1,385	....	....
Diamond-T J-5	2,000	1,485	1,725	240
Diamond-T J-4	3,000	2,050	2,200	150
Diamond-T J-3	4,000	2,200	2,475	275
Diamond-T ..... L-B	7,000	3,300	3,750	450
Diamond-T ..... R	10,000	4,200	4,600	400
Dispatch ..... G	1,200	1,150	....	....
Doane.	5,000	3,000-c	3,000-c	....
Doane.	12,000	4,500-c	4,750-c	250
Dorris 1-B-W	4,000	1,990	2,285	295
Duplex ..... E	7,000	....	3,600	....
Ellsworth	1,000	695-c	725-c	30
Fageol	4,000	....	2,750	....
Federal ..... S	2,000	....	1,750	....
Federal ..... J-M	3,000	1,800	2,200	400
Federal ..... O-P	4,000	2,100	2,450	350
Federal L	7,000	2,800	3,150	350
Federal ..... W	10,000	....	4,200	....
Forschler	2,000	1,650	....	....
Forschler	4,000	2,250	....	....

‡With other options. cWith body. †Decrease in price.

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Name and Model	Capacity in Lbs.	Old Price	New Price	Increase in Price
F. W. D.	6,000	4,000	4,000	....
Fulton	3,000	1,090	1,290	200
Garford 75	2,000	1,450	1,750	300
Garford 66	3,000	1,800	2,100	300
Garford 70	4,000	2,300	2,600	300
Garford 77-B	7,000	3,400	3,700	300
Garford 68	10,000	4,300	4,500	200
Garford 69	12,000	4,500	4,700	200
Gary .....E	1,500	....	1,350	....
Gary .....F	2,000	....	1,500	....
Gary .....G	3,000	....	1,925	....
Gary .....H	4,000	....	2,100	....
Geneva	1,500	....	700	....
G. V. worm, Elec.	1,000	....	1,500	....
G. V. chain, Elec.	1,000	....	1,360	....
G. V., Elec.	2,000	....	2,100	....
G. V., Elec.	4,000	....	2,600	....
G. V., Elec.	7,000	....	3,250	....
G. V., Elec.	10,000	....	3,700	....
Gersix	5,000	2,500	....	....
Globe	2,000	....	1,375	....
Globe	3,000	....	1,690	....
Globe	4,000	....	1,985	....
Globe	7,000	....	1,385	....
G. M. C. 15	1,500	1,090	1,150	60
G. M. C. 21	2,000	....	1,800	....
G. M. C. 30	3,000	....	1,900	....
G. M. C. 31	3,000	1,900	2,100	200
G. M. C. 40	4,000	....	2,375	....
G. M. C. 41	4,000	2,375	2,550	175
G. M. C. 70-A	7,000	....	3,200	....
G. M. C. 71-A	7,000	3,300	3,550	250
G. M. C. 70-B	7,000	....	3,350	....
G. M. C. 71-B	7,000	....	3,550	....
G. M. C. worm drive..101-A	10,000	3,850	4,100	250
G. M. C. 100-A	10,000	....	3,850	....
G. M. C. 100-B	10,000	....	3,900	....
G. M. C. 101-B	10,000	....	4,150	....
Gramm-Bernstein.	2,000	1,650	1,900	250
Gramm-Bernstein.	3,000	2,000	2,300	300
Gramm-Bernstein.	4,000	2,300	2,600	300
Gramm-Bernstein.	5,000	2,700	3,150	450
Gramm-Bernstein.	7,000	3,400	3,800	400
Gramm-Bernstein.	10,000	4,300	4,700	400
Gramm-Bernstein.	12,000	4,500	4,700	200
Hahn C	2,000	1,750	....	....
Hahn .....E	4,000	2,250	....	....
Hall	4,000	2,000	2,150	150
Hall	7,000	2,800	3,000	200
Hall	10,000	3,400	3,800	400
Harrison C	7,000	....	....	....
Harrison .....F	7,000	....	....	....
Harvey .....WFA	5,000	....	2,500	....
Harvey .....WHA	7,000	....	3,250	....
Harvey .....WKA	10,000	....	4,000	....
Hawkeye .....J	3,000	1,300	1,500	200
Higrade	1,500	....	....	....
Hoover	1,500	....	1,375	....
Horner	3,000	2,250	2,600	350
Horner	4,000	2,650	2,750	100
Horner	6,000	3,200	3,500	300
Horner	10,000	4,200	4,750	550
Hurlburt	3,000	2,250	2,350	100
Hurlburt	4,000	3,000	3,300	300
Hurlburt	7,000	3,500	3,850	350
Hurlburt	10,000	4,250	4,600	350
Hurlburt	14,000	5,000	5,500	500
Independent .....F	2,000	1,385	....	....
Independent .....G	4,000	1,850	....	....
Indiana .....T	2,000	....	1,550	....
Indiana .....D	4,000	....	2,250	....
Indiana .....R	7,000	....	3,000	....
Indiana L	10,000	....	4,000	....
I. H. C. .....H	1,500	1,225	1,225	....
I. H. C. .....F	2,000	1,500	1,500	....
I. H. C. .....F-146 w.b.	2,000	....	1,550	....
Inter-State	850	....	850	....
Jeffery 1016	1,500	965	....	....
Jeffery 2016	3,000	1,465	1,575	110
Jeffery Quad 4016	4,000	2,850	2,850	....
Kelly-Springfield K-31	3,000	2,000	2,500	500
Kelly-Springfield K-32	3,000	2,000	2,500	5 0
Kelly-Springfield K-36	5,000	2,750	3,000	250
Kelly-Springfield K-35	5,000	2,750	3,000	250
Kelly-Springfield K-40	7,000	3,400	3,850	450
Kelly-Springfield K-45	8,000	3,600	4,000	400
Kelly-Springfield K-50	10,000	4,250	4,600	350
Kelly-Springfield K-60	12,000	4,500	4,750	250
King	7,000	2,600	....	....
Kisselkar	2,250	....	1,085	....
Kisselkar	3,400	....	1,485	....
Kisselkar	5,200	....	2,100	....
Kisselkar	8,600	....	2,950	....
Kisselkar	11,800	....	3,750	....
Kleiber .....AA	1,750	1,600	....	....
Kleiber A1	3,000	2,250	2,350	100
Kleiber BB2	4,000	2,400	2,600	200
Kleiber .....B	5,000	2,750	2,850	100
Kleiber C	7,000	3,500	3,650	150
Kleiber .....D	10,000	4,500	4,500	....
Knickerbocker .....A	7,000	3,500	....	....
Knickerbocker C	10,000	4,500	....	....
Knox Tractor 35	....	4,500	4,500	....
Knox Tractor 36	6,000	5,000	5,000	....
Koehler K-1¼	2,500	....	995	....
Lambert V2	2,000	1,700	....	....
Lane .....A	1,500	1,075	....	....

cWith body.

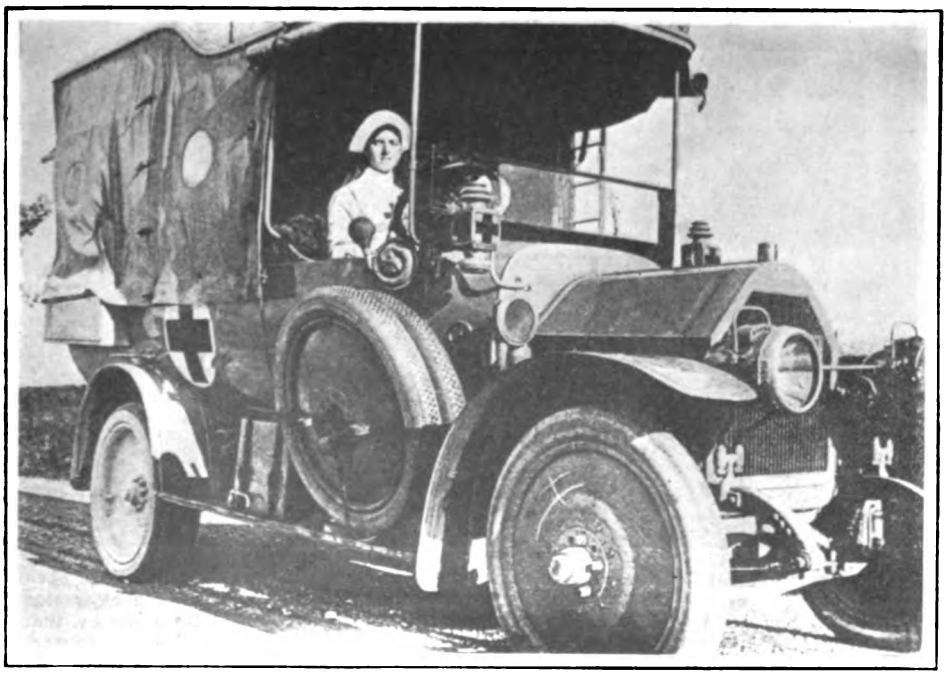
Name and Model	Capacity in Lbs.	Old Price	New Price	Increase in Price
Lange C	3,000	1,850	....	....
Lange .....B	5,000	2,450	....	....
Larrabee .....M	2,000	1,550	1,600	50
Larrabee .....N	3,000	2,000	2,000	....
Larrabee .....O	5,000	2,300	2,600	300
Larrabee .....P	5,000	....	2,675	....
Larrabee .....R	7,000	....	3,300	....
Larrabee .....S	7,000	....	3,400	....
Lawson 35	1,000	....	....	....
Lippard-Stewart .....MW	1,000	1,000	1,000	....
Lippard-Stewart ...B, C, D	1,500	....	1,600	....
Lippard-Stewart .....H	2,000	2,000	2,000	....
Lippard-Stewart .....F	3,000	2,300	2,300	....
Lippard-Stewart .....G	4,000	2,600	2,600	....
Little Giant 15	2,000	1,500	1,500	....
Little Giant .....H	2,000	1,400	1,400	....
Little Giant H-1½	3,000	1,500	1,500	....
Little Giant 16	4,000	2,500	2,250	†250
Little Giant 17	6,000	....	3,250	....
Maccar L	3,000	2,100	2,250	150
Maccar .....H	5,000	2,600	2,700	100
Maccar .....M	7,000	3,250	3,400	150
Maccar .....U	11,000	....	4,300	....
Mack .....AB	2,000	2,000	2,400	400
Mack .....AB	3,000	2,350	2,800	450
Mack .....AB	4,000	2,700	3,000	300
Mack .....AC	7,000	3,400	4,250	850
Mack .....AC	11,000	4,000	4,750	750
Mack	15,000	4,500	5,000	500
Manly 30	3,000	....	1,800	....
Manly 50	5,000	....	2,500	....
Maxwell 25	500	535	545	10
Maxwell	2,000	....	795	....
Menominee .....EW	1,500	1,295	1,425	130
Menominee .....FW	2,000	1,575	1,790	215
Menominee .....H	3,000	1,775	2,050	275
Menominee .....D	4,000	2,240	2,475	235
Menominee .....G	7,000	2,775	3,275	500
Menominee .....J	10,000	....	4,150	....
Mercury .....Z	....	....	1,200	....
Mercury .....Z-H	....	....	1,315	....
Mercury X	....	....	1,480	....
Moreland	1,500	....	1,290	....
Moreland 15-D	2,000	1,650	1,500	†150
Moreland 15-B	3,000	1,950	2,100	150
Moreland 15-C	5,000	2,550	2,750	200
Moreland 15-G	8,000	3,400	3,600	200
Moreland 16-J	10,000	3,800	4,250	450
Moon .....B	3,000	1,600	....	....
Nash 2017	2,000	....	1,450	....
Nelson & LeMoon E1	2,000	1,700	....	....
Nelson & LeMoon E2	4,000	2,250	....	....
Nelson & LeMoon E3	6,000	2,950	....	....
Netco .....D	4,000	2,350	....	....
Netco .....E	4,000	2,600	....	....
New York .....M	3,000	2,200	....	....
Niles .....B	2,000	1,175	1,600	425
Niles .....E	4,000	1,875	2,400	525
Old Hickory	1,500	825	875	50
Old Reliable	3,000	1,950	....	....
Old Reliable	4,000	2,450	....	....
Old Reliable	5,000	2,750	....	....
Old Reliable	6,000	3,250	....	....
Old Reliable	8,000	3,750	....	....
Old Reliable	8,000	3,750	....	....
Old Reliable	10,000	4,500	....	....
Old Reliable	14,000	5,000	....	....
Overland	800	625-c	665	40
Overland	1,200	725	800	75
Packard 1-D	2,000	2,200	2,325	125
Packard 1½-D	3,000	2,500	2,650	150
Packard 2-D	4,000	2,800	3,000	200
Packard 3-D	6,000	3,400	3,600	200
Packard 4-D	8,000	3,800	4,025	225
Packard	10,000	....	4,550	....
Packard	12,000	....	4,800	....
Packet	600	350	....	....
Palmer	2,000	1,350	1,485	135
Palmer	4,000	1,975	2,175	200
Palmer-Moore .....K	1,500	1,150	....	....
Palmer-Moore .....M	2,000	1,350	....	....
Peerless	4,000	....	3,000	....
Peerless	6,000	....	3,700	....
Peerless	8,000	....	4,000	....
Peerless	10,000	....	4,500	....
Peerless	12,000	....	5,000	....
Pierce-Arrow	4,000	3,000	3,300	300
Pierce-Arrow	10,000	4,500	5,000	500
Pullman 4-24	1,000	....	....	....
Rainier R-1	1,000	850	895	45
Reo .....F	1,500	1,000	925	†75
Reo .....J	4,000	1,650	1,650	....
Republic 9	1,500	750	*895	145
Republic 10	2,000	....	*1,195	....
Republic 11	3,000	....	1,450	....
Republic .....A	4,000	....	1,885	....
Republic .....T	7,000	....	2,750	....
Riker	6,000	3,500	3,900	400
Riker	8,000	3,650	4,050	400
Royal	2,000	....	....	....
Royal	5,000	....	....	....
Royal	7,000	....	....	....
Royal	10,000	....	....	....
Royal	12,000	....	....	....
Rowe	2,000	....	2,450	....
Rowe	4,000	....	2,800	....

†Decrease in price. *With open express body.

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Name and Model	Capacity in Lbs.	Old Price	New Price	Increase in Price
Rowe	6,000	....	3,000	....
Rowe	7,000	....	3,400	....
Rowe	10,000	....	4,500	....
Rush ..... D	1,000	695	895	200
Sanford ..... O	2,000	1,290	....	....
Sanford ..... R	3,000	1,370	....	....
Sanford ..... S	4,000	2,100	....	....
Saurer L	10,000	4,800	....	....
Saurer ..... M	13,000	5,800	....	....
Schacht	3,000	2,650	2,650	....
Schacht	4,000	2,800	2,800	....
Schacht	6,000	3,200	3,200	....
Schacht	8,000	4,000	4,300	300
Sandow ..... A	2,000	....	1,275	....
Sandow ..... B	3,000	....	1,750	....
Sandow ..... D	4,000	....	2,350	....
Sandow ..... E	7,000	....	3,250	....
Selden ..... G	1,500	985	1,075	90
Selden ..... TL	2,000	1,700	1,850	150
Selden ..... TX-TXL	2,000	1,385	1,550	165
Selden ..... JWL	4,000	2,350	2,550	200
Selden ..... JC	4,000	2,150	2,350	200
Selden ..... NL	7,000	3,150	3,400	250
Selden	10,000	....	....	....
Schleicher	6,000	3,500	....	....
Schleicher	10,000	4,500	....	....
Service 220	2,000	1,375	1,500	125
Service 230	3,000	1,950	2,200	250
Service 240	4,000	2,250	2,500	250
Service 270	7,000	3,000	3,300	300
Service 275	7,000	3,250	3,600	350
Service 300	10,000	4,000	4,300	300
Signal ..... F	2,000	1,550	1,700	150
Signal ..... H	3,000	1,800	2,000	200
Signal ..... J	4,000	2,100	2,300	200
Signal ..... M	7,000	3,000	3,000	....
Signal ..... R	10,000	4,000	4,000	....
Standard 70	4,000	2,000	2,300	300
Standard 60	7,000	2,850	3,000	150
Standard 40	8,000	3,025	....	....
Standard 50	10,000	3,400	3,700	300
Steele C	4,000	2,250	2,250	....
Steele ..... B	6,000	3,000	3,000	....
Steele ..... BA	8,000	3,500	3,500	....
Steele ..... A	10,000	4,000	4,000	....
Stegeman	4,000	....	2,600	....
Stegeman	6,000	....	3,000	....
Stegeman	8,000	....	3,800	....
Stegeman	10,000	....	4,500	....
Stegeman	14,000	....	5,000	....
Sterling	5,000	2,800	2,800	....
Sterling	7,000	3,400	3,600	200
Sterling	10,000	4,500	4,500	....
Sterling	14,000	4,750	5,250	500
Stewart 5	1,000	695	....	....
Stewart 6	1,500	....	845	....
Stewart 3	2,000	....	1,390	....
Stewart 4	3,000	....	1,585	....
Stewart 7	4,000	....	2,100	....
Studebaker ..... SF	1,000	785	885	100
Studebaker 7	2,000	1,100	1,200	100
Stanley, steam	1,500	1,550	....	....
Stanley, steam	2,500	2,000	....	....
Sullivan	3,000	....	2,150	....
Sullivan ..... E	4,000	2,250	2,600	350
Superior ..... A	2,000	1,350	1,500	150
Superior C	4,000	1,800	2,000	200

Name and Model	Capacity in Lbs.	Old Price	New Price	Increase in Price
Thomas 40	4,000	2,700	3,000	300
Thomas 70	7,000	....	3,500	....
Tiffin ..... A	1,500	1,190	....	....
Tiffin ..... AW	2,000	1,450	....	....
Tiffin ..... GW	3,000	1,790	....	....
Tiffin ..... MC	5,000	2,360	....	....
Tiffin ..... MW	5,000	2,500	....	....
Tiffin ..... RW	10,000	4,250	....	....
Tiffin ..... SW	12,000	4,550	....	....
Transport Tractor	10,000	2,500	2,750	250
Union	5,000	1,875	2,075	200
United ..... BSW	4,000	2,250	....	....
United ..... CSW	7,000	2,900	....	....
United ..... DSW	8,000	3,300	....	....
United ..... ESW	10,000	3,900	....	....
U. S. ..... E	5,000	2,200	2,500	300
U. S. ..... H	5,000	2,500	2,800	300
U. S. ..... D	7,000	2,700	3,200	500
U. S. ..... J	7,000	3,150	3,500	350
U. S. ..... K	10,000	4,000	4,400	400
Universal ..... G	3,000	1,950	....	....
Universal ..... D	4,000	2,800	....	....
Universal ..... A	6,000	3,400	....	....
Velie 25	4,000	2,250	....	....
Velie 26	7,000	3,350	....	....
Vim	1,000	635	765	130
Walter	6,000	....	4,500	....
Walter 4-wheel dr.	10,000	....	4,750	....
Walter tractor	....	....	4,750	....
Walter rear drive	10,000	....	4,500	....
Walter	12,000	....	4,700	....
Walter	15,000	....	5,000	....
Walter tractor rear drive	....	....	4,500	....
Ware	7,000	....	4,000	....
Watson tractor	10,000	3,600	....	....
White ..... GBBE	1,500	3,100	2,300	200
White ..... TBC	3,000	3,000	3,300	300
White ..... TAD	6,000	3,700	4,100	400
White ..... TCD	10,000	4,500	5,000	500
White ..... ATCD	10,000	....	5,550-c	....
Wichita ..... A	2,000	1,350	1,750	400
Wichita ..... K	2,000	1,650	1,750	100
Wichita L	3,000	1,800	1,950	150
Wichita ..... B	4,000	2,100	2,250	150
Wichita ..... M	4,000	....	2,250	....
Wichita ..... R	5,000	2,350	2,500	150
Wichita ..... O	7,000	3,250	3,450	200
Wichita ..... Q	10,000	3,850	4,000	150
Wilcox ..... S	2,000	1,750	....	....
Wilcox ..... R	3,000	2,150	....	....
Wilcox ..... Q	4,000	2,500	....	....
Wilcox ..... P	7,000	3,000	....	....
Wilson	2,000	....	1,650	....
Wilson	4,000	2,350	2,550	200
Wilson	7,000	....	3,250	....
Witt Will W-1-17	2,000	2,000	2,000	....
Witt Will W-2-17	4,000	2,500	2,500	....
Wisconsin ..... B	2,500	1,650	....	....
Wisconsin C	5,000	2,500	....	....
W. S. 4	5,000	2,975	....	....
Zeitler & Lamson	3,000	1,850	....	....
Zeitler & Lamson	5,000	2,450	....	....
Zeitler & Lamson	7,000	3,150	....	....
Zeitler & Lamson	10,000	4,150	....	....



Only Woman Driver of an Italian Ambulance

DAISY MAZZUCHI, the wife of the Italian consul at Rheims at the outbreak of the war, is the only woman ambulance driver permitted on the Austro-Italian front by the Italian government. She is now stationed at the Ospedale di Riserva Latisan in Undine, where she drives her own ambulance, as shown in the illustration. She works 15 hours a day, dividing her time between driving the ambulance between the rear trenches and the hospital and in the operating room.

Madam Mazzuchi has led a very strenuous life while on the Italian front, working almost continuously day and night. Her ambulance has been shot full of holes, and even the hospital itself has on many occasions been seriously damaged by Austrian shells. During the past year more than 3500 wounded have passed through the small hospital served by her ambulance.

Madam Mazzuchi is at present in this country to raise funds to extend hospital work in Italy.

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Novel Advertising Bodies Bring Increased Profits

Secret of Success of Advertising on Truck Bodies Is Association of Vehicle and Product Handled

Part II



One of a large fleet of department store delivery vehicles equipped with a most unusual type of body designed to convey to the general public the class and tone of the store operating them. They are operated for the Hub, a large department store in Chicago, and are characterized by the unusual shape of the body with side windows, a coupé top over the driver's cab and fancy side lamps of the carriage type

NOVELTY is the life of advertising. Economy is the religion of business. Good advertising and economy are combined when a motor car is converted into a moving billboard. A score of well-known firms in different parts of the country have made their light delivery vehicles serve a two-fold purpose by carrying an optical message to all who see them. Every vehicle on the streets has a potential advertising value. This is much better recognized in Europe than in America. There nearly every business vehicle and every motor bus and street car is plastered with signs. These are offensive to the eye, however, and lack effectiveness because they are not novel.

All forms of advertising bodies may be divided into two main classifications as follows:

1—Those for purely advertising purposes in which no loads are carried.

2—Those of a utilitarian nature which both advertise and carry the wares sold by their owners.

Vehicle Efficiency Comes First

Of these two classes the utilitarian type is by far the most important because such vehicles accomplish real work in addition to the advertising services rendered. The average motor truck owner should combine both features in his vehicle body, always remembering that the first duty of a motor vehicle is to deliver goods more economically than horses. The advertising value of its body should never be placed before the vehicle efficiency. A body should never be designed with a view to a peculiarity in shape and a disregard of its interior arrangement that would reduce its efficiency as a means of transportation.

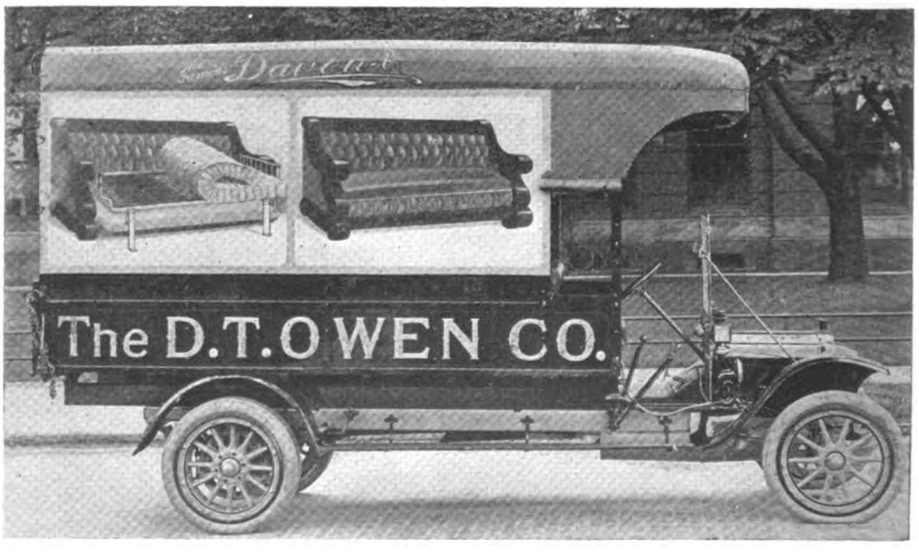
Besides, it is not difficult to combine the load-carrying and advertising properties of a truck body. For example, this has been done very effectively in practically every instance in the illustrations accompanying this article. The giant cement barrel body on the truck owned by the Atlas Portland Cement Co. to collect and carry empty cement bags from various jobs to the main plant is an excellent example of the utilization of the combined load-carrying and advertising properties. Another is that of the Ford used by Thaddeus Davids and fitted with a giant ink bottle on its rear deck in which bottles of ink, paste, mucilage, advertising matter, etc., are carried.

Even the non-utilitarian Moxie and electric iron float bodies might have been arranged to carry small loads, the former of advertising literature, the latter electric iron equipment between the main store and the branches, provided the vehicle was run on a route touching the branch stores.

Points of Association

In deciding upon a body to give good advertising results, the first thing to consider after the load carrying conditions have been fulfilled is to make the body novel. If it is to attract attention it must be different from the everyday type seen on the streets. It must create a stare on the part of pedestrians seeing it if effective results are to be obtained.

In addition to being different, it should also associate the truck with the business of its owner and the goods which it carries. Another important requisite is that the body should have the name of the owner in legible and easily-read letters. The shape and form of the name letters should correspond with the general contour and color of the body. Whether or not the address of the owner should appear on the body depends on the size of his business and the degree to which he or his company is known in the territory in which the truck operates. For instance, if the vehicle is owned by



The large capacity of the truck body, required to carry bulky folding beds, has been made use of by the D. T. Owen Co. for advertising purposes. The large clear side made it possible to use two full-sized paintings of the patented bed made by that concern. The pictures were especially well selected because they contrast the appearance of the bed in its open and closed positions. The truck used is a White 1½-tonner

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a large department store whose name is a household word, it is hardly necessary to include the address. On the other hand, if the vehicle is owned by a small merchant it is perhaps better to use the address in order to make himself better known in the community in which he does business.

Elegance of Body Design

Elegance of body design and finish is also a matter of important consideration. Fancy designs should not be used for ordinary lines of business such as those of grocers, butchers, laundries and the like. On the other hand, florists, jewelers, milliners and large department stores may profitably incorporate a certain degree of elegance into their vehicle bodies in order to differentiate them from the more ordinary lines of business. When this is done, however, great care should be taken that good judgment is used. It is very important that good taste should be exhibited both in the body design and in the color combination employed. The owner should pay particular attention to these details for the reason that many body builders, if left to their own resources, are apt to produce a body so fanciful and with such poor color schemes as to become displeasing to the eye.

The color of a motor truck body also has a very direct bearing on its advertising value. Delicate tints should be avoided because such tints soil very easily. Distinctive colors which in themselves associate the body with the business of its owner may often be used. For instance, the golden sunshine yellow used on the trucks of the Loose-Wiles Biscuit Co., operated from all of its branches throughout the United States, associates its vehicles at once with the Sunshine biscuits made by the same concern. Again, a pure white body mounted on a truck owned by a dairy will at once associate such a vehicle with the cleanliness of the product which it delivers and the cleanliness of the methods of plant operation pursued by the company which owns it.

Value of Contrasts

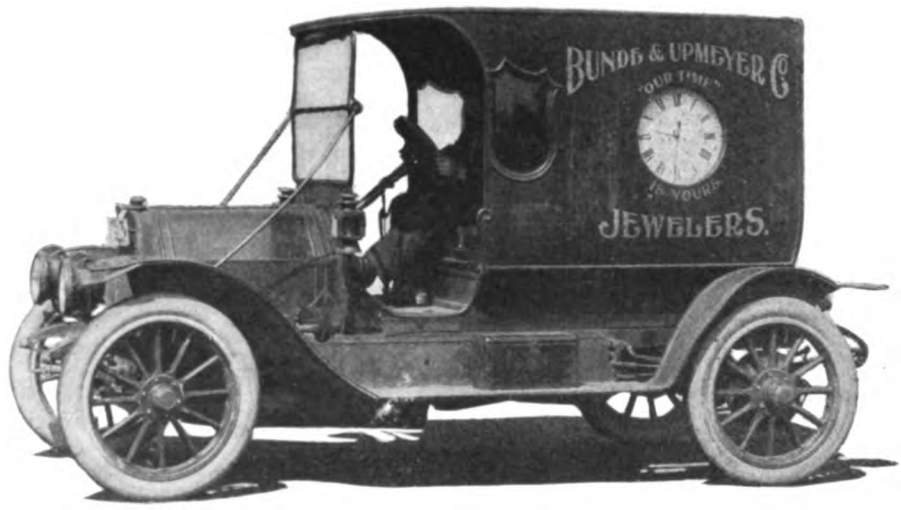
A striking example of the use of white bodies is that of the Youghiogheny Coal Co. of Pittsburgh, Pa., reputed to be the smokiest city in the United States. Imagine a white body for carrying coal in a city which hardly ever sees the sun until 9 or 10 o'clock in the morning because of the smoke! Yet that is exactly what the Youghiogheny Coal Co. has done, its purpose being first of all to attract attention by the novelty of the idea and second in order to induce the truck drivers to keep their vehicles clean because their dirtiness is so readily discernible. No matter what the coloring of the body may be, the lettering should be painted in a color which blends with it.

Besides the name of the owner on the body side and perhaps his address, the remainder of the space may be utilized for signs of various descriptions. It is important, however, that the side of the body should not be cluttered up with too much lettering so that none of it is legible. In instances where the name of the product hauled by the truck is better known than the name of its maker, it is sometimes advisable to use the product name alone—as for example the word Innovation, designating the Innovation wardrobe trunk made by the company of the same name, and Uneeda Biscuit or Ivory soap, made respectively by the National Biscuit Co. and Procter & Gamble.

Another important advertising advantage of a truck body not generally utilized by retailers is the use of changeable signs to indicate special sales and the like in progress at the stores of the owners during particular periods of the year. For instance, the grocer might very well advertise sales of sugar during the canning season or special prices on plum puddings, raisins, nuts and similar articles during the Christmas shopping period. Such signs as these always attract the attention of pedestrians and generally result in increased sales. Several of the department stores have carried out this idea very successfully in advertising their various merchandise



The business of this 1,500-pound White truck is at once proclaimed to all who see it by the fact that a portion of its load of biscuits in tins is carried in tiers of three special shelves on each side of the body. Each tin is held in place by means of a small wood cleat pivoted to the edge of the shelf. These are turned from a vertical position to one parallel with the edge of the shelf by means of the thumb and in this position the cans can be lifted directly off the shelves and carried into the grocery stores without any delay in unloading. The remainder of the load is carried inside the body and is taken out in the usual manner through the door at the rear. While this type of body has unusual advertising features, the cans must be closely watched by the driver or his helper to prevent street urchins from sampling the wares while deliveries are being made



This body earns its keep by advertising its owner's business. It is operated by a Milwaukee jewelry concern and is equipped with two Seth Thomas clocks, one on each side of the body. The clocks are mounted on coil springs and inclosed in the back by wooden boxes. The faces are covered by heavy plate glass. The vehicle, a Mitchell, is mounted on pneumatics, front and rear, and while it has run several thousand miles, the clocks have given practically no trouble

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Water, water everywhere and plenty of drops to drink, might have been the perversion of the Ancient Mariner's exclamation as applied to the truck shown above with its water advertisements. The signs are simple and well arranged and point the way for other owners to make use of their truck-body sides for advertising purposes. The truck is owned by D. O'Donnell & Co., Memphis, Tenn.

sales, as, for instance, August furniture sales, dressmakers' sales and the like.

When signs are used on the body sides it is advisable to repeat them on the rear for the reason that the side signs may not be read by the person on the sidewalk while the vehicle is passing, but once his attention is attracted he will invariably turn around and if he does not find a similar sign on the rear, the advertising value of the side signs is practically lost.

Some of these essential points are shown in each of the illustrations given herewith. For example, the D. T. Owen truck, with its illustrations of the open and folded bed made by that company, is a good example of the poster or side-sign idea. The truck of the Bunde & Upmeyer Co. is a particularly good example of the novelty idea in that good time-keeping clocks are shown in the sides. Both of these instances are excellent examples of the association of the truck with the product which the owners sell, folding beds in the first case and jewelry and timepieces in the second.

Examples of Unusual Bodies

A giant pill-box, Thermos bottle, Victrola, medicine bottle, bird cage, ink bottle, candy carton, cement barrel or electric iron is pleasing to the eye. It is unusual, and is therefore the cynosure for the gaze of everyone on the street. Other concerns have gone even farther in their search for novelty. A soft-drink manufacturer has built a giant hobby horse, mounted on a small car chassis, which is ridden by a jockey in exactly the manner a live horse would be. An amusement park has devised a giant mannikin which walks in a natural manner, apparently pulling a heavy car behind him. A vaudeville house sends an illuminated billboard out decorated after the style of the theater and accommodating the driver in a replica of one of the boxes. A brewer sends out one of his heavy 5-ton trucks nightly with an illuminated sign of deep relief, painted and gilded beautifully and brilliantly lighted electrically, the decorative portion being demountable, so that the chassis may be used to deliver beer in the daytime. A tobacco manufacturer has sent a car all over the country on whose glass sides an animated electric sign in full color demonstrates the simplicity of "rolling your own" cigarette.

These outfits naturally fall into two classes—namely, utilitarian and non-utilitarian. The advantages of the former are great and their possible field is much larger than that of the type used purely as a novelty.

Thermos Truck Famous

The American Thermos Bottle Co., New York City, for example, one of the pioneers in this form of enterprise, has sent its famous Thermos car all over the country. It was at the Panama-Pacific International Exposition and the San Diego fair. Each year it covers an itinerary of fairs, conventions, celebrations and events of all sorts which draw large crowds. Dealers in these useful containers vie for the privilege of accommodating it in their respective cities. Its visits are anticipated by a replenishing of stocks and a generous window display, for the sales stimulation is real.

These periodic visits of the Thermos car are not idle tours, however, for the crew that goes with it is made up of young men with a keen eye for advertising possibilities. They carry a supply of advertising literature and samples of the bottles and containers. They put new life into dealers who have neglected the vacuum bottle trade, they get new dealers and they supply every dealer with new literature, window displays, etc.

The first Thermos car was put on the streets more than ten years ago. It was all of nickeled metal, an exact scale reproduction of the well-known type, the small cap serving as the hood for the engine and the body of the bottle for the driver's cab and load space. Part of the original body is still in use, having been incorporated with the new body.

When not on its tours this truck serves at the home office for a delivery vehicle.

The Emerson Drug Co., New York City, has (in similar service) a number of light runabouts, on the rear decks of which are large wooden reproductions of the familiar Bromo-Selzer bottle. These vehicles are assigned to certain definite territories, which they traverse periodically, taking orders from drug stores and soda fountains and promoting the sale of the remedy. One or more of the windows of stores are dressed up with Bromo-Selzer displays. Not only is this done free for the dealer, but he is given twenty 10-cent bottles or two of the $1 size in payment for two weeks' use of the window. A supply of advertising literature is also carried in the wooden bottle for distribution.

Thaddeus Davids has a Ford, on the rear deck of which is a reproduction of a large bottle of writing fluid. The label on this bottle is in reality a metal door, which opens for access to the commodious interior, in which ink, paste, mucilage, sealing wax samples and advertising literature are carried.

A Bird Cage on Wheels

On Fifth Avenue at Thirtieth Street, in New York, is the store of George Holden, a dealer in fine birds and goldfish. There is so much else on Fifth Avenue and so many other avenues in the Metropolis that there are many bird and fish buyers who might never know of this unique store but for its equally original delivery vehicle.

It is a small Saxon chassis and its body is just a big bird-cage. Of course, it is not actually a cage, but so cleverly has the body builder done his work that it is a startlingly faithful reproduction of the standard bird cage, even to the tag, labeled "This side up—Live bird."

So far the car has remained right side up for two years and manages to deliver all of the pets sold in New York or its immediate suburbs. It has even made long trips into the country, where particularly valuable birds were wanted in a hurry.

The front of the body is left open, for the driver sits partially within the cage, the birds being put on shelves in their cages and the fish in paper oyster pails. On every package sent out by Holden's is a gay black-and-gold sticker with a picture of the little car.

Landay Bros. are New York's largest distributors of Victrolas and records. One of the present delivery trucks used by this concern is—and all of those purchased in future will be—designed with a mammoth Victrola at its middle. It is an accurate scale enlargement of the distinctive case of the standard $250 instrument and is made of real mahogany varnished with marine varnish to resist the elements. Although it has been in use for two years, it is as resplendent as when first installed.

This vehicle is purely utilitarian. It is a 1½-ton truck, a Hurlburt, and the gigantic Victrola serves the very practical purpose of providing side doors for the body. It is used for regular deliveries to the five Landay retail stores in Greater New York to deliver machines

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and records from the warehouse to customers and in some cases to pick up particular machines at the various stores for delivery to customers who insist upon possession of particular instruments.

For the records there is a locked compartment at the front of the body with shelves, so that these delicate disks are protected from breakage.

The presence of the side doors permits the truck to be loaded or unloaded from either side or from the rear. The instruments may also be packed in the best manner to carry well, without regard to the sequence of delivery, for through one or another of the three doors any part of the body is immediately accessible.

Closed Cabs Pay

So much impressed is Max Landay, the president of the firm, with the advertising value of this body design that all the other Landay trucks are to be equipped with similar bodies as soon as possible. The driver's cab is also interesting, being fully vestibuled. This protects the driver, reasons Landay, and that protects the Landay business. No man can be an efficient worker if he is not comfortable physically. How this works out is indicated by the fact that the driver of this truck was not off on sick leave once last winter.

The manufacturers of Pep-O-Mint also employ a novel advertising body in everyday practical delivering. A 1½-ton Autocar distributes the confection throughout the Greater New York district, the huge cylindrical cover serving as a very efficient container without restricting the usefulness of the truck in any way. The construction of the chassis is such that the driver naturally occupies a position at the extreme front, so that with two port-holes in the side, his view is very clear.

Dr. Jarvis, an itinerant patent medicine specialist, employs a Ford with a giant pill-box very effectively in his whirlwind campaigns for the sale of Dr. Jarvis' Bullets, cathartic pills put up in bullet form and contained in packages of the same shape. The pills are introduced in one city at a time by an intensive campaign of publicity and stocking of dealers and then the entire base of operations is moved. Naturally, there is much transportation required in the distributing of samples, the placing of displays and advertising matter and demonstrations to dealers.

Giant Cement Barrel Novel

Cement bags are expensive, but necessary, and the collection of empty cement bags is a very necessary part of the work of the Atlas Portland Cement Co. These bags are returned by purchasers of cement to dealers, for there is a refund of several cents for each bag. Likewise the dealer receives a reward for their return from the manufacturer. The collection of these empties by the manufacturer is a business in itself. The bags must be counted and payment made for the number returned. Obviously this is no work for the delivery trucks of the manufacturer, and so the Atlas company has a special truck for this purpose.



This White 1½-ton truck is one of three owned by the Moxie Co., Boston, Mass. It is characterized by its low body sides permitting the ends of the Moxie boxes with the trademarks to show above them and by the life-sized figures of a man and woman, such as are supplied to the ice cream stores, placed on the body sides at each of the four top uprights. By this means the advertising equipment used in the various ice cream emporiums and drug stores is linked up directly with the vehicle which delivers Moxie to them and the sales of the beverage thereby increased through this mobile advertising which reaches every part of the city where a vehicle can run

Advertising individuality has been combined with utility by making the body in the form of an elephantine cement barrel. It is built of wood, the front end being fitted with a windshield and with doors and windows at the sides. It is mounted on a Mack 1½-ton chassis and covers all of the Metropolitan district of New York. It has made several trips to Philadelphia and back.

The Original Moxie Horse

Most original among motor advertising devices, of course, is the Moxie Horsemobile. This outfit, exclusive patents on which are held by the Moxie Co., Boston, Mass., comprises a wooden horse mounted on the bare chassis of a Metz motor car, the steering column extending through the neck of the horse, with the wheel just over the saddle horn and the pedals having extensions. The horse is life size, with glass eyes and real hair and tail. He has a bridle woven of horsehair by a former cowboy serving a life sentence in prison and an English riding saddle with a history.

It is ridden by Moxie Joe, or in private life Joe Doncette, a former equestrian clown. Its only purpose is to advertise Moxie, the soft drink. It is driven through the country, following the State and county fair circuit. In each town it is greeted with an open-mouthed crowd, a right-of-way from traffic officers because of the congestion of the curious created at every stop, and generous publicity from the newspapers. It is the only vehicle of its kind in the world and is likely to stay so, hence it is a long time before the surprised witness forgets it or the enterprising beverage manufacturer responsible for it.

Last summer it made a trip of about 9000 miles through New England, touching every city of importance in the territory. This summer the middle Atlantic States are to see it and the intention is to send it the rounds until the entire country shall have had at least one look at the strange contrivance.

The Moxie company also carries out its advertising enterprise in its delivery trucks. These are 1½-ton Whites with bodies quite utilitarian and conventional, save for the simple expedient of mounting painted figures of two characters familiar in Moxie window displays, namely, a handsome soda clerk and a typical summer girl, each having those magnetic eyes which always stare an observer directly in the eye from any angle, and a compelling index finger.

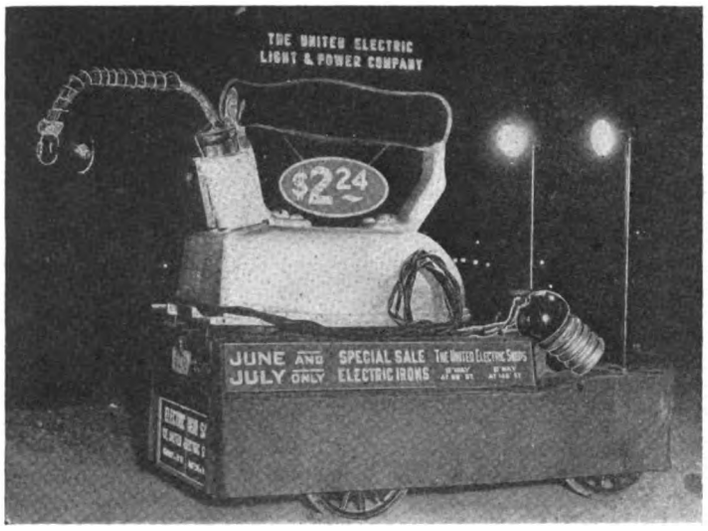
Advertising More Developed Abroad

The use of truck bodies for advertising purposes is much greater in England and on the Continent than in the United States. In Great Britain some truck owners have even gone so far as to advertise products of other concerns on the sides of their vehicle bodies.

This course has its advantages and disadvantages. It has been worked out very satisfactorily by concerns whose trucks are engaged in work not especially confined to products sold by themselves. Of course, foremost among these are the bus companies, followed by large concerns which do contract hauling, and by large wholesalers and those who supply large quantities of raw materials and who do not need to make appeals to pedestrians for business. In such cases the revenue secured from the truck advertising is considerable, and in many cases enables the owner to materially reduce the net operating cost of his vehicles. Such a course has its disadvantages for the small retail merchant who loses valuable advertising space himself and who might frequently give an incorrect impression of his own business by the character of the advertisement. Again, other concerns' advertising on his vehicle might attract more notice to them than to his own name and the business in which he is engaged.

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Advertising Bodies That Have Brought Results



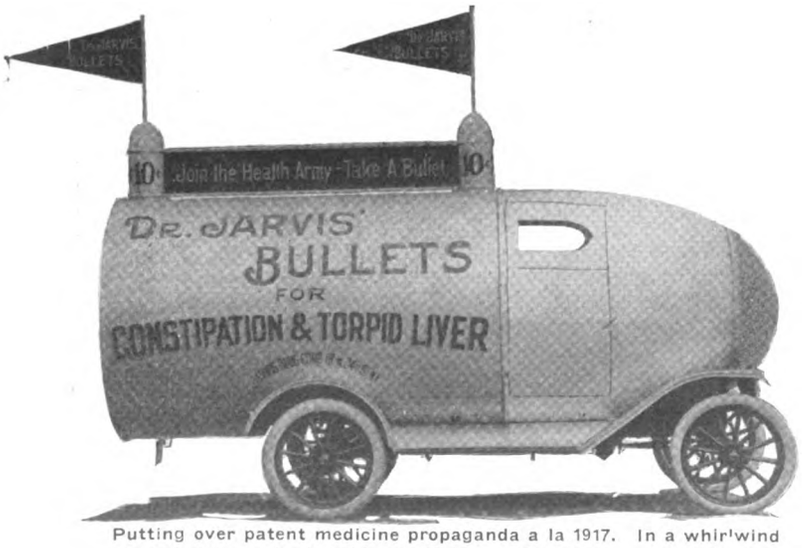
A forceful enunciation of the electric gospel. First of all, the electric iron is a perfect enlargement of the real thing to brobdignagian size. Next, it is carried about on an electric truck chassis and lighted by three electric flood-lights. Advertising of this sort brings sales volume that makes such prices possible



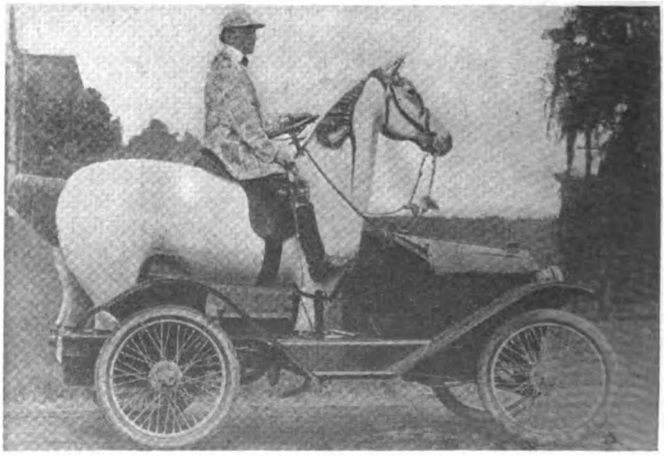
You won't forget that Davids makes ink if this machine passes you. If you are an office manager it may be worth a lot to Davids for you to be reminded of their products, yet since it is only the city salesman's car that reminds you, this vivid advertisement costs them nothing



Just a delivery truck for a popular confection, yet its strange form, embodying the shape of the package in which Pep-O-Mints are sold, keeps the name alive in the minds of thousands, makes this delivery truck stand out from the host of the plain, unimaginative ones which throng our streets



Putting over patent medicine propaganda a la 1917. In a whirlwind campaign in each city this terrifying outfit creates a large market for pills without interfering with the practical utility of the Ford delivery car that lies within it



Moxie Horsemobile I, Moxie Joe up. Sire, Kentucky thoroughbred; dam, Metz 22. Record, 1 mile, dirt track, in 1:20 flat. This is what boosts Moxie sales on the state and county fair route

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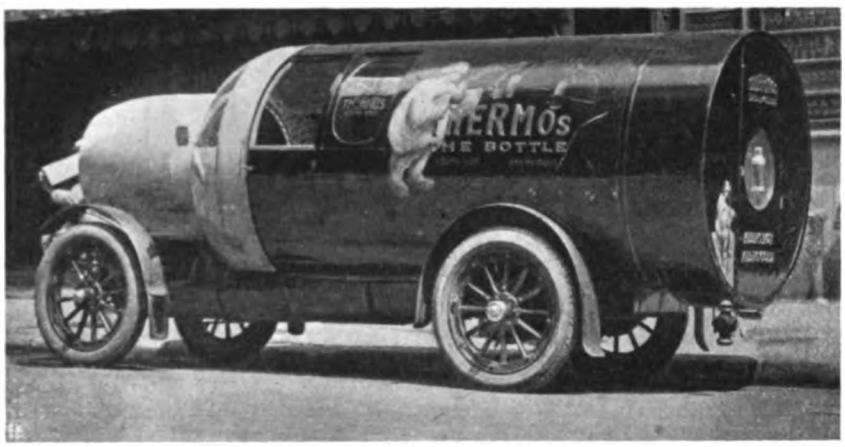
By the Association of Truck and Product Hauled



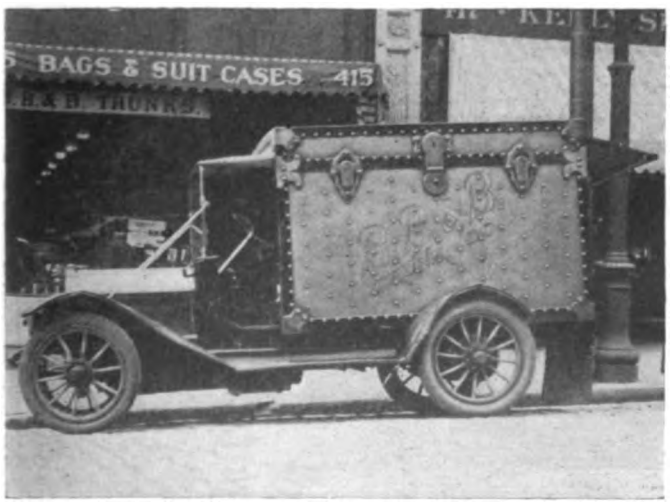
If Goliath had had a talking machine it would have been about this size. Save for its proportions, it is a real mahogany duplicate of a standard $250 Victrola case, and it serves a useful purpose as side-doors for one of the delivery trucks of the New York Victor distributors



It's a real cask, and you won't let it pass without looking to see who owns it. The Atlas Portland Cement Co. collects empty cement bags efficiently while making acquaintances wholesale at practically no cost



Every important city and every important exposition in the country has been visited by this car or the one that preceded it. There is no question that it boosts sales, and dealers in Thermos bottles are willing to fight to have it come to their towns

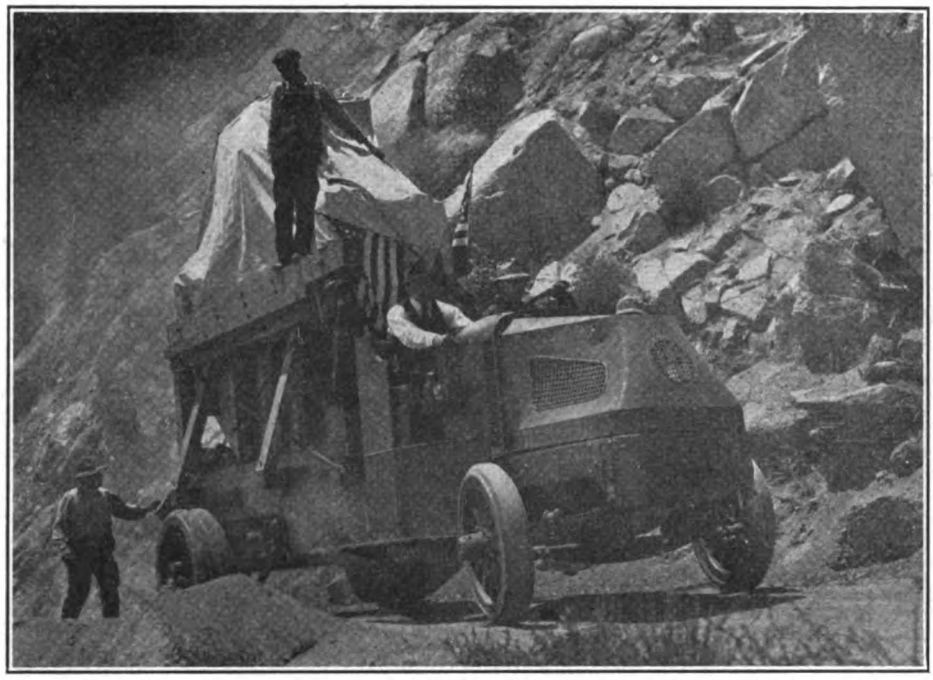


This giant trunk, a duplicate on a mammoth scale of the ordinary size, even to rivets, hasps and lock, is used by Boyd, Boyd & Boyd, Pittsburgh, Pa., trunk makers, to deliver their product. It will hold twelve trunks or a whole galaxy of suit cases and smaller bags



Only a bird in a gilded cage, yet the best salesman for new business this exclusive Fifth avenue bird and fish merchant employs. It is an exact duplicate of the standard canary, cage, trapeze, etc., on a small car chassis

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The precious load on its way up Mt. Wilson. Some idea of the narrow road and mountainous country may be had from the boulders in the background. Notice the helper with his hand on the handbrake, to apply it instantly in case of emergency

Truck Climbs Mt. Wilson With World's Largest Mirror

Steep Grades and Sharp Turns Require One Man to Operate Brakes for Safety

WHAT is said to have been the most notable contribution of the motor truck to science was the transporting Sunday, July 1, of a 100-in. reflecting mirror, the largest in the world, from the plant of the Carnegie Institution of Washington, D. C., in Pasadena, Cal., to the summit of Mt. Wilson, where it will be housed in the new observatory now nearing completion. George D. Jones, superintendent of construction at the observatory, told J. A. Stoner, of the International Mack Corporation, who drove the 5½-ton Mack truck used, that the truck proved the solution of a transportation problem that had worried the observatory officials for 12 years, or ever since the glass was cast. The mirror reached its destination absolutely unmarred.

Years to Duplicate Mirror

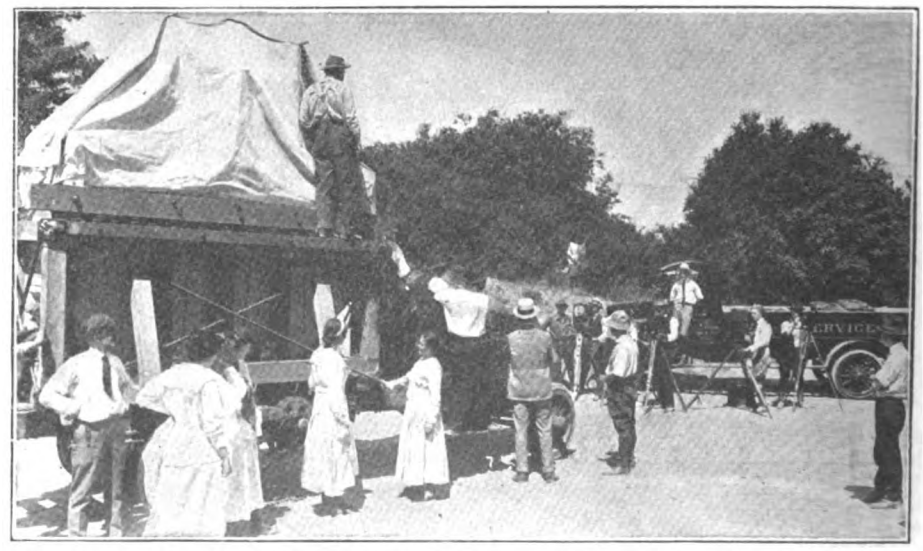
This mirror, which will bear the name of the Hooper Glass, from J. D. Hooper, who provided the funds for its making, is declared to have been the most precious load ever entrusted to truck hauling. Not so much because of its intrinsic value, although it is understood to represent well over $100,000 in actual financial outlay, was this burden so exceedingly costly as because it cannot be duplicated. By its reflected rays, which will be so intense that it is claimed a man could walk across its surface and his presence not be detected, astronomers hope to have revealed secrets of celestial bodies that could be ascertained through no other method.

The night before the truck made the ascent of the 9½-mile mountain trail, a crank boasted in Pasadena that the mirror never would reach the observatory in safety. He immediately was placed under arrest and confined in jail. Four armed guards accompanied the expedition. A bridge that spans a canyon over which the truck had to pass was examined and tested in every timber. Scouts went out ahead to make frequent forays into the brush and the trained eyes of the guards scanned every tree and overhanging ledge of rock along the trail. The identity of every person on the trail at the time was known.

The work of priceless value is 100 inches in diameter and 13 inches thick. It weighs 4½ tons. It was ordered cast at St. Gobain's, France, in 1905 and was delivered in Pasadena in 1909. Two years were spent in trying to secure a better glass and this was found impossible. Grinding was begun at the Institution's plant in Pasadena in 1911. Half a ton of glass was removed from the original piece, most of it being ground from the upper, or concave, side. The work was in charge of Dr. G. W. Richey, who ground the Yerkes observatory mirror. It was done in a room of constant temperature and the glass was at all times surrounded by lintless cloth to prevent dust from coming in contact with the surface. A special French rouge was the grinding preparation.

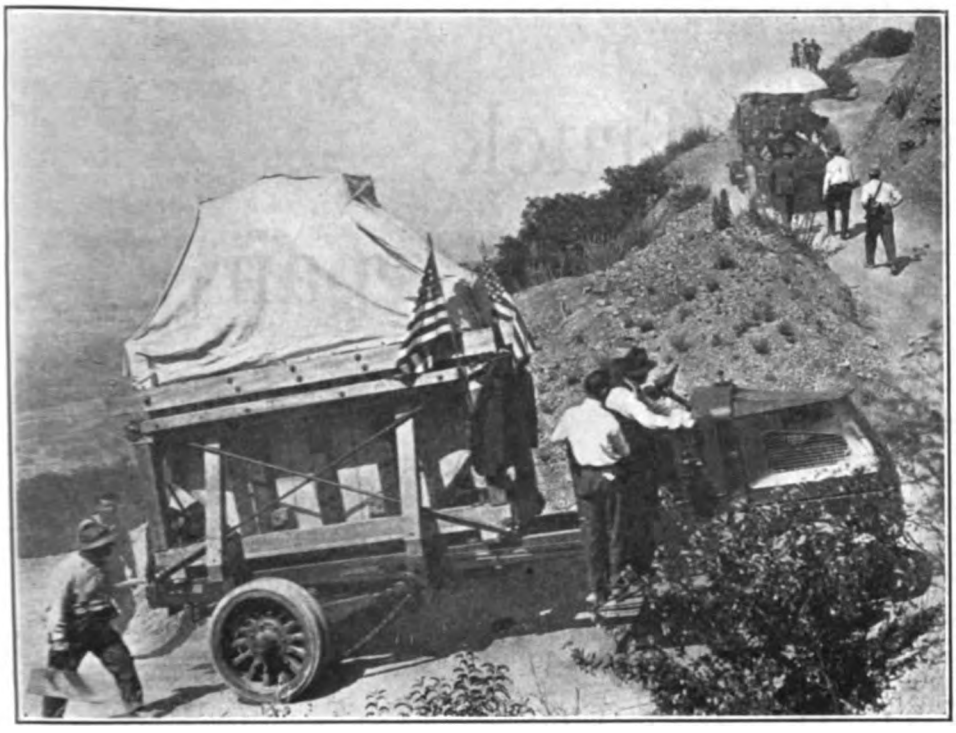
Representing as it did one of the most painstaking tasks in the world, every precaution that could be devised was taken in preparing the big disk for removal to the observatory. Hundreds of thousands of dollars had been spent in building the huge dome on the summit of the mountain, 6000 feet above sea level, to house the mirror and the telescopic apparatus which is a marvel of mechanical exactness and which astronomers from everywhere have come to see. All of this expenditure would have gone for naught had the slightest accident happened to the giant mirror in transit.

When it is learned that this great block



Truck at the top of the trail, with moving-picture machines clustered about it to record the successful completion of the task. A very good idea may be had of the special cradle with its diagonal braces and coil springs beneath the longitudinal stringer supporting the mirror box

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The 20 per cent grade and sharp turn on the trail known as the Devil's Elbow. Note the narrow road, which often made it necessary for the truck to back and fill to get around the turns

of glass has been ground so accurately that its surface changes from the heat of a man's body 3 feet away, and it was expected to undergo considerable harmless distortion while on the truck, the reason for the care shown in preparing it for the trip can be realized. The mirror rode on edge in an octagonal air-tight box, 10 feet deep and 2 feet wide. Between the glass and the paraffine lined box were successive layers of carded wool padding. These served the dual purpose of protection against shock in moving and maintaining as even a temperature as possible.

Extra Man Works Brakes

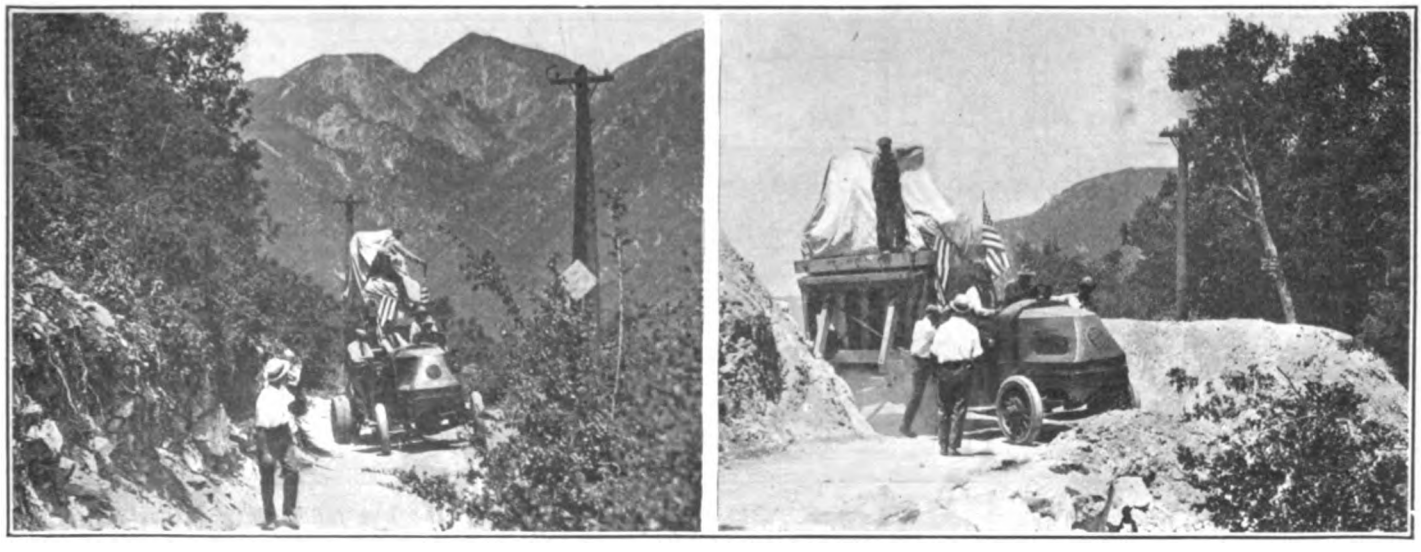
The box was encased in a cradle of heavy timbers extending beyond the frame of the truck. Between these timbers and the box were powerful but delicately adjusted coil springs. The whole was covered with canvas. Although the glass weighed 4½ tons and was placed on edge it rode as easily as a feather floats in the breeze. The total weight of the load on the truck, not including the driver and five men who were in constant attendance, was 7½ tons. The services of one of these men was required for the emergency brake, as the instant release of the driver's hand from the steering wheel to grab the brake might have brought disaster. One rode on top of the cradle to lift or cut the telephone wires that cross and recross the trail. One was needed on each side to warn the driver of too close proximity to precipitous abyss or foreboding mountain side. The crush of a hub against the rock might have toppled the entire mass over the ledge, as it was a top-heavy load standing 10 ft. 9 in. above the frame of the truck.

While astronomers and scientists throughout the world were, figuratively speaking, holding their breath for fear something might happen before the reflector reached its final destination, the Mack truck was performing one of the noblest deeds of peace in history. The truck proceeded slowly; it had to, the risk was so great. It was geared 39.83 to 1 on low, 24.32 to 1 on intermediate and 14.1 to 1 on high. Only once on the entire trip was high gear used and this was on the boulevard between the plant and the toll house at the foot of the trail.

The Mt. Wilson trail is a one-way road, but there are about fifty turnouts in the 9 miles from toll gate to toll gate. It is a constant climb, having an average gradient of 12 per cent with no letup. The tread of the truck was so much wider than the road that the wheels had to break their own way. The 14-ft. wheelbase of the truck was so long that it had to back and fill in making almost every turn. Until the shade of the pine trees was reached on the upper half of the journey, the sun beat on the trail with terrific heat and the thermometer indicated 92 deg.

In order to keep the truck's engine working at the point of greatest efficiency, three stops were made and the water in the radiator changed entirely. This was done by opening the pump and the valve in the cylinder casing and permitting the heated water to flow out as cold was added to the radiator so as to make the change gradual. The truck was a stock AC model and nothing was removed except the fenders and cab top. This was done so that Stoner could watch the front wheels on the trail and the telephone wires above. Despite the precautions, one telephone pole guy wire was not got free in time and the pole was broken off at the base. It is ½ mile from the upper toll gate to the observatory and the truck was backed beneath

(*Continued on page* 33)



Left—The man on the top of the high load is pushing aside the telephone and guy wires to the poles.
Right—A bad turn in the road, which required great skill on the part of the driver

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Better Truck Maintenance and Repair

Send Us Your Ideas

Make a rough pencil sketch of some good motor truck repair or maintenance method you have made or employed and mail it to us with a short letter telling how you did it

This Frame Repair Has Saved Time and Money

BROKEN or cracked frames are not what may be considered frequent occurrences in the every day life of the average motor truck, yet they sometimes happen, and usually at just the time when the truck is working under full pressure and when a lay-up can be afforded least.

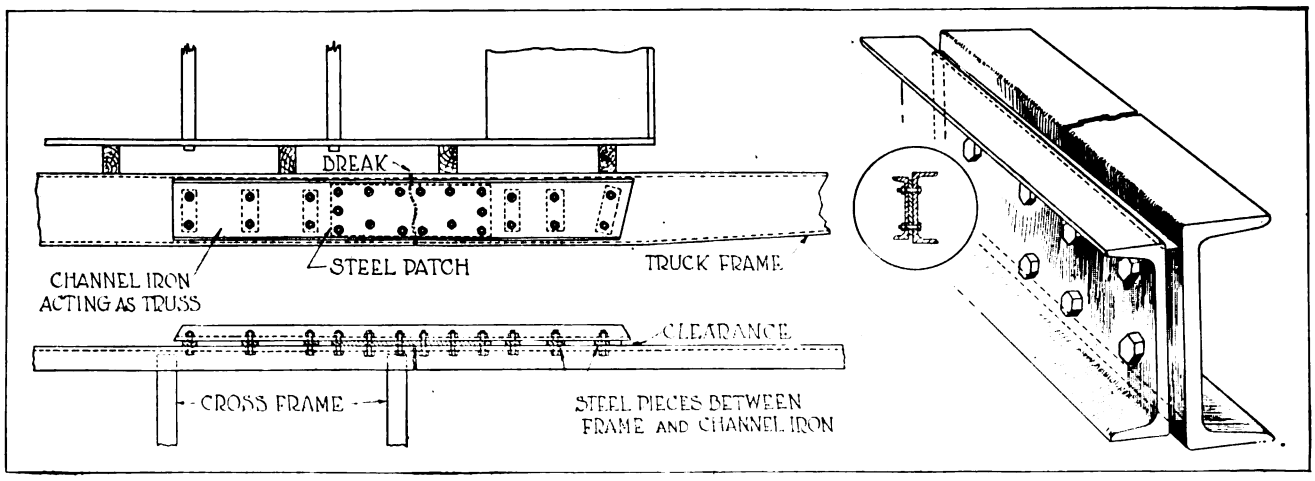
At such times it is usually out of the question to attempt to replace the frame because of the amount of time consumed. Unless another truck is available to take the place of the injured one, it generally devolves upon the man in charge of the trucks to make some sort of temporary repair, and yet one which will not cause damage to any of the other truck parts through its own weakness.

William Gries, truck superintendent for P. Ballentine & Sons, large brewers, maltsters and bottlers of Newark, N. J., has had to face similar conditions and has worked out the frame-repair method shown in the reproduction of his sketch given at the bottom of this page. Gries states, however, that a repair made as shown is considered a permanent one and will remain so unless some unforeseen event occurs. Several such repairs have been made under his supervision many months ago, and not the slightest deflection has been noticeable.

The method as indicated is very simple and consists of the use of a steel plate patch at least 10 or 12 in. long to be placed on the outside of the frame and then reinforced by a longer piece of channel iron bolted outside of the patch.

It is important that a patch sufficiently long be employed or else there will be a tendency for the frame to deflect at the point of breakage.

The piece of channel iron outside of the patch



A reproduction of Gries's sketch, showing the method of frame repair which he has followed in several instances with satisfactory results

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is to be made considerably longer than the patch itself in order to further strengthen the joint by making it more difficult to deflect the channel iron. Rectangular pieces of flat iron are used as spacer bars and drilled to permit the holding bolts between the ends of the patch and the ends of the channel being brought up snugly in order to procure a lasting job.

Both the steel patch and the spacer bars between the channel bar and the frame are made of a size, shape and thickness to conform with any convenient spacing so as not to interfere with the bolts already in the frame for connecting the cross-frame members. In cases where the channel bar added extends beyond the points at which the cross-frame ends are bolted, the rivets forming the connection may be cut out and slightly longer bolts inserted through the holes to firmly bind together the channel, spacer bar or patch, frame and the end of the cross member. Lock washers of an improved type should be used under the nut on each bolt so there will be no chance of their dropping out because of the vibration and permitting the frame to deflect at the point of breakage.

Gries says that the repair as shown can be done on a 5-ton truck by one mechanic in about 2 days' time, thereby showing a saving of approximately $100 in time and labor as compared with purchasing and fitting a complete new frame, to say nothing of the money lost while the truck is standing idle from 10 days to 2 weeks during the new frame installation.

Gries' experience with welding a broken frame is that with heat-treated frames the process of welding ofttimes destroys the benefits of the heat treatment near the break and leaves a weak spot there after the job has been completed.

A Quick Repair on a Broken Manifold

SOMETIMES engine manifolds are broken by having heavy objects drop upon them in the shop or by the collision of one truck with another. While it is not difficult to repair such a break if the manifold is of brass or copper because of the ease by which such materials may be soldered or brazed, it becomes more of a task if the manifold happens to be of cast aluminum.

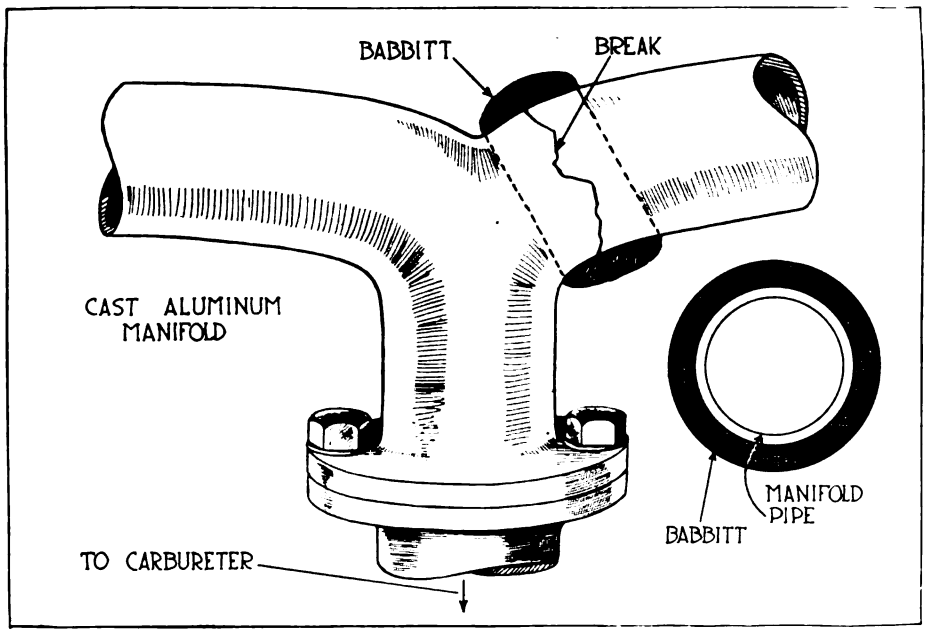
If such is the case, the oxy-acetylene method may be used or aluminum solder employed. The former makes it necessary to have the proper equipment on hand and the latter requires considerable skill in handling the solder and flux to turn out a satisfactory job.

A simple method is shown in the sketch on this page, in which a ring of babbit has been formed about the break. The babbitt was run into place, as shown, by building up a mold of fireclay around the fracture and pouring the molten metal in from a vent in the top. By making the babbitt band extend far enough on either side of the break, sufficient rigidity is had to make the repair a permanent one.

The unsightliness of the babbitt has been formed nated after it has cooled by filing off the rough spots. If the manifold is of cast iron, somewhat of the same method may be employed to solder on a band of metal.

If the manifold should be of cast iron instead of aluminum, brass or copper, it may be brazed at the break without serious difficulty. A similar process cannot be followed in the case of aluminum because of the intense heat.

Still another method which may be employed is the autogenous process or oxy-acetylene welding, in which new metal is run into the break to effect a permanent repair. Many small shops do not have occasion to do sufficient welding of this nature to require the purchase of an oxy-acetylene outfit unless it also be used for burning carbon out of engine cylinders. If such an equipment is not at hand, the method shown in the sketch below offers a ready means of relief.



The ring of babbitt metal shown was poured in place by the use of a fireclay mold around the manifold fracture

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Lessons of the Great War in Motor Truck Design

By W. Owen Thomas

Of particular interest at this moment is this, the second installment of W. Owen Thomas's paper on "Lessons of the War in Truck Design," as presented before the recent S. A. E. meeting in Washington, D. C. Its interest is chiefly pertinent because he treats of the many details of truck design which have proved satisfactory or unsatisfactory on foreign fields and because our own army truck specifications are now being revised. The third installment will be printed in the next issue of THE COMMERCIAL VEHICLE.



W. Owen Thomas, author of the paper on war truck design, part of which is published herewith

THE engines of American trucks in France often gave trouble from the fact that they were not sufficiently run in before they were put into hard service. The engines must be of a heavy duty type designed and balanced to run at a continuous speed of 20 m.p.h. on high gear in emergency.

The war has developed more improvements in engine details than in general design. Plain bearings without oil grooves have come into much more general use. The use of floating piston pins and floating connecting-rod upper bushings has also come to stay. Many fixed piston pins in engines giving serious trouble have been replaced in the field with floating pins which have plain cast iron stoppers to prevent the steel pins rubbing the cylinder sides.

Valve push rod roller pins have also been replaced in the same way with floating pins, and in general the lesson has been learned that for heavy service a floating pin or bearing is not only more easily replaced in the field, but shows much less wear than a fixed surface with concentrated pressure on one point.

The rear bearings of engines suffer considerably from the overhanging weight of clutches and universal joints and from the pressure caused by the non-alignment of annular bearings with engine bearings in the case of inclosed unit clutches. The latter is especially evident when the engine bearings have been re-scraped and taken up, and occurred to such an extent that I am convinced of the need of the complete separation of the clutch from the engine unit. The universal joint can then be brought up close into the flywheel, which in turn should also be carried well forward so as to overhang the rear bearing as little as possible.

The removable head cylinder block is receiving quite a little attention from European engineers on account of the advantage of completely machined surfaces, the need of cleaning after continued service and the ease of grinding the valves. At least two new designs are using an overhead camshaft and valves in conjunction with a removable head.

Pistons without ribs and with more liberal bearing surface above the piston pins are in evidence. In some cases repair pistons have been made with one of the rings down close to the piston pin to allow of more bearing surface above. The increased surface allows more liberal clearances and tolerances in replacing pistons in worn cylinders and materially decreases piston knocks.

It was noted that many valves broke in the recessed portion for the valve spring retainer. Many of the foreign engines have a recess ground to a curve to avoid sudden change in section, as it is impossible to allow for a proper fillet, except with a very large valve stem. The parts of overhead valve mechanisms are seldom liberal enough in bearing surface. Here again, floating pin and ball surfaces show less wear than fixed surfaces.

Adjusting nuts on valve lifters or valve stems do not stand up under the repeated hammering of war service; the best system noted is to provide small caps covering the valve stem ends holding thin stamped shims for adjustment of the clearance.

Valve springs on certain makes of engines break without apparent cause. On these the trouble was often removed by making taper springs which would indicate that the breakage was due to vibration set up in the spring itself.

The marking of the flywheel often causes confusion in the setting of the valve timing, etc. No marks other than the top dead center of number one cylinder should be put on the flywheel.

The holes in both upper and lower ends of connecting-rods should be ground to accurate size and surface after heat treating. These were a source of trouble with most American and many European engines.

Three bearing crankshafts for war service should be at least one-half of the cylinder bore in diameter of main bearings and crankpins. All bearings should be longer than their diameter and care should be taken to minimize the leakage of oil from the ends by the omission of all oil grooves and continuous relief at the parting line of the two halves of the bearing.

Pressure lubrication to all main crankshaft, crankpin and camshaft bearings is absolutely essential. Pressure lubrication to piston pin bearings is not necessary if a floating bushing in the top of the connecting-rod and a floating piston pin are used.

Better lubrication of fan and auxiliary bearings is necessary. Care must be taken that oil overflowed on to gears, etc., does not rob the lubrication of any bearings. It is better to overflow the system through a weighted valve, the stem of which acts as a pressure indicator. Pressure gages are absolutely unreliable and useless in the service except for temporary connection during an engine test.

Oil Filters a Source of Trouble

Oil filters are a constant source of trouble and are never half liberal enough. The best filter in service has six vertical removable coarse mesh screens in series in a side pocket bolted on to the lower crankcase. The removal of the pocket permits thorough cleaning and also provides a liberal hand hole for washing out the case with a steam and kerosene jet.

No piping connections or loose tubes should be used on the lubrication system. The flange support of the oil pump and other parts should contain all the connections and be provided with a tough gasket. All piping should be made part of the case by pressing large externally ground steel tubes with stepped fits into long reamed holes in the case after all drilling is finished.

Oil level indicating blades should be notched on the edge to show amount of oil in case and marked with three lines indicating high, normal, and low oil levels regardless of quantity.

All brass bearing shells should be finished with a threaded surface before the bearing metal is applied, in such a way that the points of the thread come within a few thousandths of an inch of the surface of the bearing. Most bearings sent from America have too thick a babbitt coating to properly conduct the heat from the wearing surface, and many of the shells are drilled or punched full of holes before being babbitted.

Three-point support of engine is necessary; the supports should not be over 26 in. wide on account of the need of narrow frames to allow for the small steering radius. The supports of all size engines should be the same, as it is necessary sometimes to use a larger engine in a special purpose truck.

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Carburetion is a very delicate subject for American manufacturers. One French officer told me that they all needed an extra Pyrene jet. The French have made much progress since the beginning of the war in the development of variable venturi carbureters without spring air valves or other moving parts. On one type the jet is lowered by the opening of the throttle to prevent backfiring with a lean mixture and the balance restored when the gasoline head in the well is drawn down by the suction of the engine. Much trouble has been caused by the use of small screws in brass castings of carbureters, and even by breaking of lugs from castings.

In the main the lack of economy in carburetion of American engines is due to having to leave the mixture on the rich side to guard against backfiring. This is made worse in practice by the constant weakening of springs and the sticking of automatic working parts due to the dusty conditions during convoy driving. Ignition systems need cleaning up in their small details. There is little choice between a magneto system and a well-designed single-spark generator system. Both give more trouble with condensers than with their main essentials, and both suffer from poor wiring. The development of a wiring system that is completely mounted on a fibre rod or other support that can be taken off by undoing a couple of clips would be a great advantage.

The plug connections should press down on top of the plugs in such a way that they can be swung to one side for the removal of a plug. The magneto or distributer connections should come to their proper place without having to trace the wiring. Magneto couplings should only connect one way and should be entirely independent of the means employed to adjust the advance.

Water pumps should have more liberal packing glands and should use only ¼-in. square woven packing cut into single rings for a standardized shaft. Pumps should be arranged for repacking without removal.

Good mufflers are as scarce in France as good Germans; much work should be done to produce a stronger and more easily cleaned muffler that is worth putting together the second time. The normal type is useless under service conditions.

The gasoline system is a very difficult problem. In general the simplest possible tank system is best and two medium size tanks better than one large tank with reserve capacity. A tank under the seat is difficult to inspect or repair, but anywhere else it involves a troublesome pressure or vacuum system. All such systems have given trouble in service, and probably the best plan is to place two separate removable tanks under the seats in such a way that one can be easily removed from each side in case of trouble. The type of tank that has given best satisfaction is pressed in two similar halves with a flanged and lapped joint horizontally around the center. The tank is supported on a wooden runner for the whole length of the flange on one side and on a short wooden support on the other; wooden wedges are driven in to hold down the flanges. To remove the tank it is only necessary to open the side door of the seat, drive out the wedges, disconnect the supply pipe, and pull out the tank like a drawer on the wooden runner under the flange. A similar method can be used with a round drawn tank by fastening it with bands or supporting it in a tapered hole lined with brake lining at the inner end.

The piping from the two tanks should be independent, with a shut-off valve on each end of both pipes. The pipes themselves give trouble. They should be ½ in. in diameter and could with advantage be woven on the outside with some material that would prevent crystallization.

Very large filters with settling chambers should be used supported on the frame half way between the tank and the carbureter at the lowest point of the system.

A large filler opening should be provided on all tanks for filling and cleaning purposes. This should be as near the center as possible to enable the hand to reach to all parts of the tanks.

Gasoline is handled in France entirely in rectangular 8-gal. cans. These are easily carried in their original sealed form as reserve. After they are emptied they are used at the front for handling water in the trenches.

Individual plain and finned tubes are very much in evidence in radiator construction on account of the ease of repair of this type. Large tank capacity especially at the top of the radiator is necessary. Flange or union joints are necessary to enable the radiator to be quickly removed without disturbing the hose connections.

Hose connections should be large, as with the heat the rubber swells on the inside and obstructs the passage. There is need to develop a type of hose which will not collapse on the suction side without the insertion of a wire spring. Fans should be large and not too high speed, as fan bearings and belts are a favorite trouble. It is worth arranging for a proper mechanical drive to the fan as part of the engine front drive, as it is always a choice between heating and belt trouble with too loose a belt and bearing trouble with too tight a belt. With a mechanically driven fan a spring drive clutch is absolutely necessary.

Practically all starter trouble is with the overrunning clutches or with the flywheel gearing. The motors themselves and the batteries have given better service than would be expected when they receive proper attention.

All lighting should be arranged on the single wire system with interchangeable single point lamps and with none in series. The tail lamp should show a light sideways on the ground for inspection from the driver's seat.

Normally 2-candlepower lamps are used in all lights with 8-candlepower in the searchlight. The lamps are in service away from the front. In a fog it is necessary to use 8-candlepower lamps in all lights, including the tail lamp, as convoy driving in a fog is very difficult.

Spare lamps of both candlepower should be installed on a covered panel with blind sockets on the dash. All lamps should be flexibly connected to sockets, on the dash or frame. These should be identical with the lamp sockets, so that lamps can be used for testing and can be used in these sockets instead of in the lamps in case of accident.

(*To be continued*)

Important Items of War Truck Design

As Gleaned from Second Installment of Mr. Thomas's Paper

1—Engines must be able to run continuously at a speed proportional to a truck speed of 20 m.p.h. on high gear, to take care of emergency conditions.
2—Fixed piston pins give much trouble.
3—Floating pins and bearings best for field service.
4—Clutch should be separate from the engine unit because of the excessive strain of overhanging weight on rear engine bearings.
5—Pressure lubrication of crankshaft, crankpin and camshaft is essential.
6—Oil-pressure gages are unreliable.
7—American carbureters are poor.
8—Ignition systems need refinements.
9—Ordinary type of muffler useless under service conditions because of flimsiness.
10—Gasoline tanks under the seat should be removable from the end; two tanks are better than one large one with reserve capacity.
11—Gasoline pipe lines should be woven on the outside with some material to prevent crystallization.
12—Radiator fan should not be belt driven.

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Winther Four-Model Line Is Based on Truck Lessons in Mexico

WINTHER SPECIFICATIONS

Capacity	4000	6000	8000	1200
Wheelbase, in.	144 in.	144	156	156
Tires, front	34x4	36x4	36x5	36x6
Tires, rear	34x6	36x4d	36x5d	40x6d
Bore, in.	3¾	4	4¼	5⅛
Stroke, in.	5	6	6	5½
N. A. C. C. hp.	22.50	26.50	29.00	42.20
Speed, r.p.m.	—	1025	1025	950
Speed, m.p.h.	16	14	12	10
Gear ratio in high gear	—	8.2-1	10.0-1	12.0-1
Final drive	Int. gear	Int. gear	Int. gear	Int. gear

WINTHER trucks, designed from the experience gained by the use of trucks with the Pershing expeditionary force in Mexico, are offered in four models ranging in maximum capacities from 4000 to 12,000 lbs. The Winther company's engineers studied the weaknesses of various makes of trucks in the Mexican campaign and the present Winther line, described and illustrated on these pages, is the result of their experience, in which they have tried to combine the strongest features of the various makes and avoid the weaker ones.

All four models are practically identical in design except for the sizes of the load-carrying and power-producing parts. All have Wisconsin engines with Stewart vacuum feed gasoline systems, dry-plate clutches, three-speed individual-clutch type gearsets mounted amidships, final-internal-gear drive on the Hotchkiss plan and Besco metal disk wheels on the 4- and 6-tonners, with Hayes wood wheels on the 2- and 3-tonners.

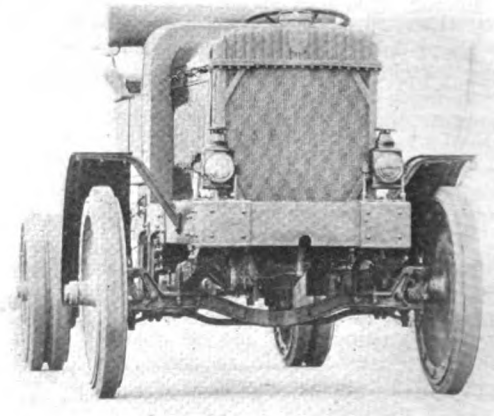
The Winther line includes models of 2-, 3-, 4- and 6-ton maximum capacities. In each case the engine is located under a distinctive hood with louvres on the side. The three smaller models have their engine cylinders cast in block and the fourth in pairs. Similarly, the valves on the three smaller engines are located at the left and opposite in the 6-tonner. All employ water cooling, with a circulation provided for by means of a centrifugal pump. The radiators have distinctive cast cases with fins on the top tank and employ zigzag-tube cores.

Master carbureters are used on all four models of the line and are fed from the tanks under the seats by means of Stewart vacuum systems. Each engine is also governed by means of a Simplex centrifugal-type governor driven off the engine. In each case the engine lubrication is provided for on the pressure system with the gears in the motor lubricated by a gear pump. Similarly, ignition in each case is by a high-tension magneto of Eisemann make with a hand-controlled spark advance. All models employ dry-plate clutches of Borg & Beck manufacture, which transfer the power to constant-mesh, individual-clutch gearsets of Cotta manufacture mounted amidships. From there the power is taken to the Celfor internal-gear-driven rear axle in each case. These are arranged on the Hotchkiss plan to take both the torque and propulsion through the rear springs of Mather make.

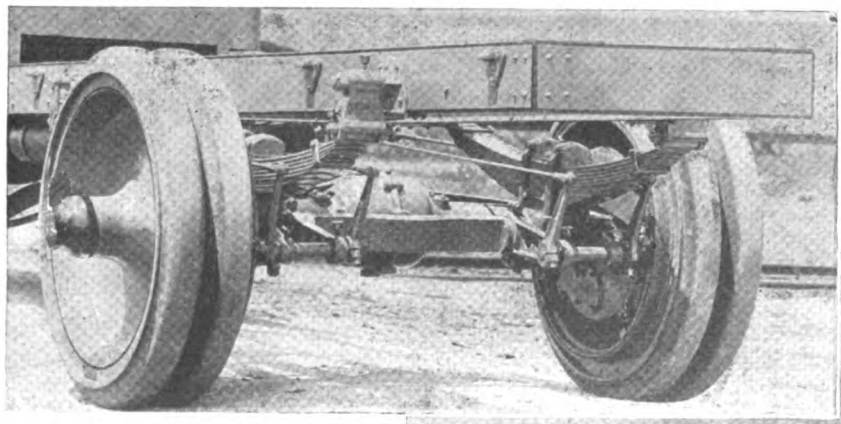
The frames are of rolled channel on all four models and are put together on the semi-flexible plan. On the small model the wheels are of wood, while on the three larger units they are of the metal disk type as manufactured by the Buchanan Electric Steel Co., Buchanan, Mich.

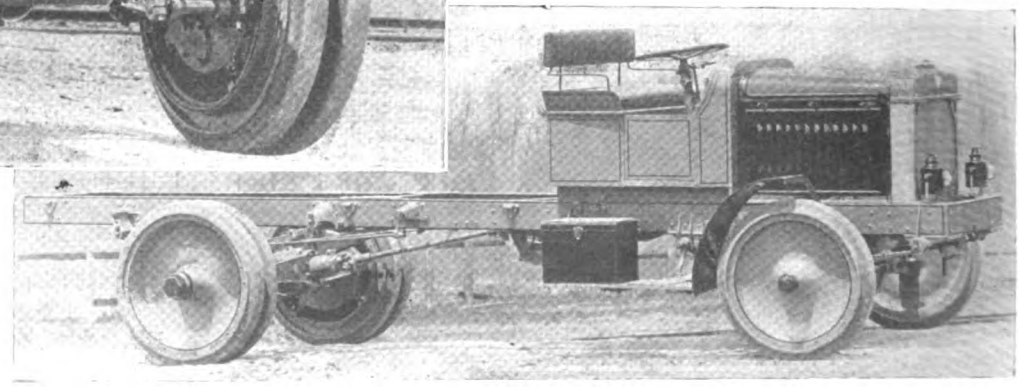
Right steer and center control are employed on all models. Hand brakes on the 2- and 3-ton models are of the internal-expanding type, and the foot brakes of the external-contracting type, while on the two larger models they are of the dual internal-expanding type. In each case both sets are on the rear wheels. The brakes on the 3-, 4- and 6-tonners are all 2½ in. wide with diameters of 18, 24 and 29½ in. respectively. The steering gears on all models are of the worm-nut, non-adjustable type, of Ross manufacture.

The equipment furnished includes side and tail lights, seat, tools, jack, cab doors, etc. Two-unit starting and lighting systems may be had on each model as additional equipment at extra cost. The price of this equipment, which is of Westinghouse manufacture, is $125, $150, $150 and $175 respectively for the 2-, 3-, 4- and 6-ton models. Each model is offered in short and long wheelbase lengths, the long wheelbase models being priced slightly greater than those of the standard length. Dual rear tires may be had on the 2-ton model at extra cost and similarly single rear tires on the other three models.



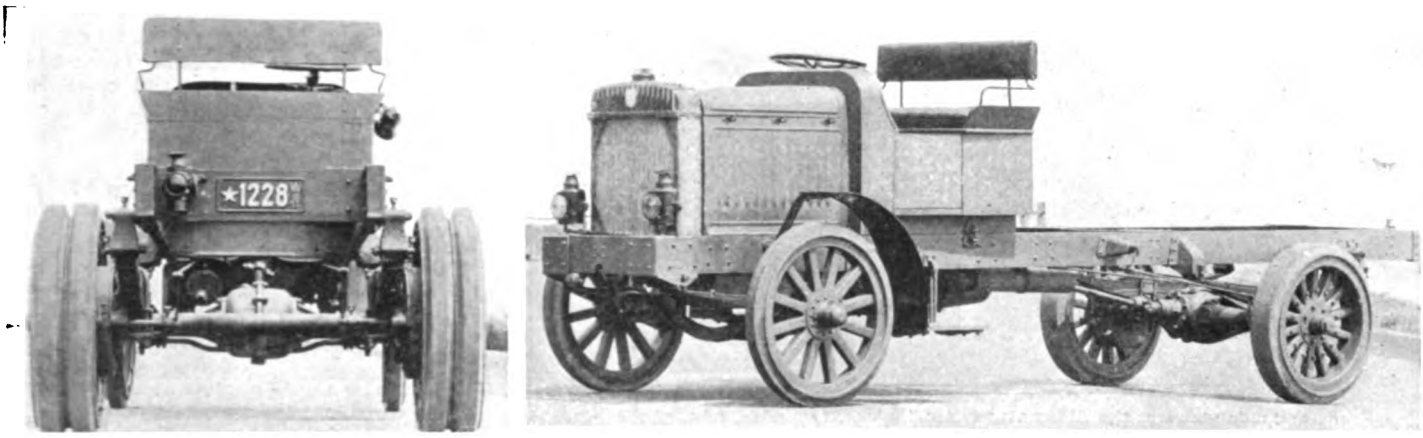
Front view of the Winther 4-tonner, showing distinctive radiator and front axle and spring assembly





Above, rear view of the Winther 4-tonner, showing the details of the Celfor rear axle. At the right, the 4-ton chassis, with steel wheels

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Rear end and side views of the Winther 2-tonner, which follows the same general design as the other three models of the line except for the use of wood instead of steel wheels

Steamotor 2-Ton Truck Employs Doble Steam Powerplant

THE new 2-ton Steamotor truck made by the Steamotor Truck Co., Chicago, as announced in the last issue of THE COMMERCIAL VEHICLE, employs the steam powerplant designed by Abner Doble and used on the Doble passenger car. The vehicle differs little in appearance from the conventional gasoline truck. It employs a condenser of the honeycomb radiator type at the extreme front, with boiler and burner under the ordinary hood. The water tank is directly under the floorboards and the engine beneath the driver's seat, with a kerosene tank at the extreme rear between the side members of the frame.

The steam and water system consists of the boiler and the condenser; the fuel and the combustion system of the fuel tank and the burner beneath the boiler, and the engine system of the steam engine with a one-piece shaft with two universals which transmits the power direct to the worm-driven rear axle.

The Doble generator or boiler is of the water-tube type, and consists of twenty-eight identical sections placed in an insulated casing. Each section consists of two horizontal headers connected by the vertical tubes. These are made of cold-drawn seamless steel arranged vertically, swaged at either end, and welded to the top and bottom headers. The intake water manifold from the water tank delivers the water simultaneously to the tube sections through their lower members, the water being forced in by a plunger pump.

The water level is maintained in the tubes at about their midpoints by means of a by-pass valve. The by-pass is so arranged that when the regulator tube is filled with steam and consequently hot, it will close by the expansion of the tube, forcing the water from the pump to lift the check valve and enter the generator.

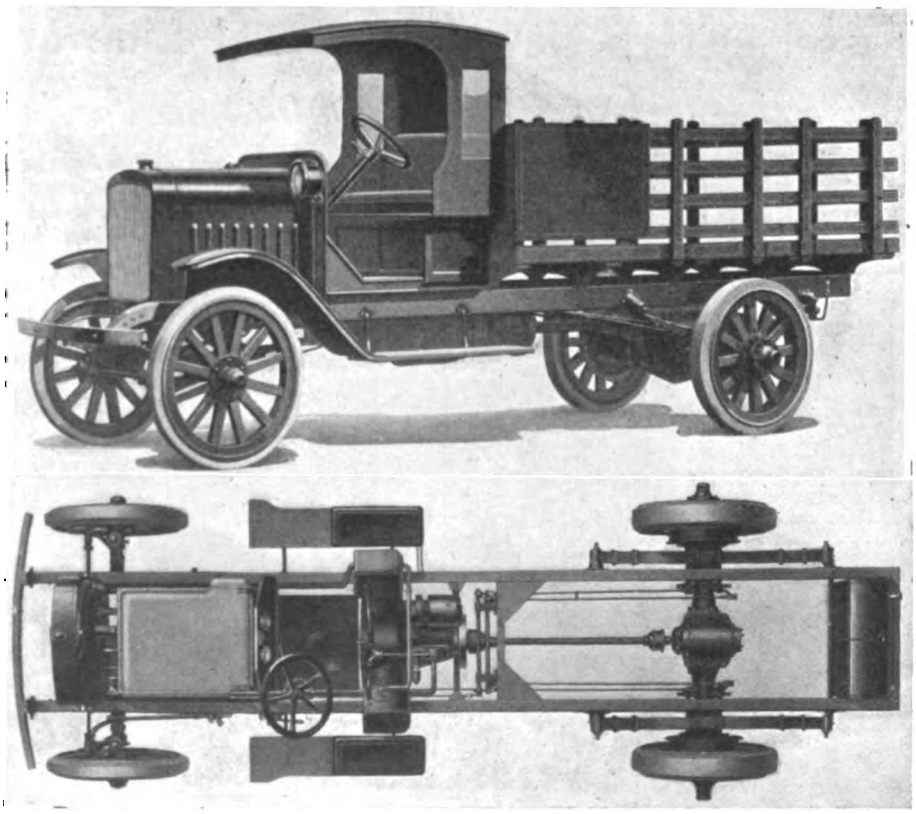
The latter is divided by means of a crosswise bridge wall to make the hot gases from the combustion chamber give up their heat to the closely grouped vertical tubes. The live steam is led from the upper headers of the generator into the manifold and thence through the throttle valve down to the steam chest of the engine.

STEAMOTOR SPECIFICATIONS

Capacity, lbs.	4000
Price	$3,000
Wheelbase, in.	144
Tires, front	36x4
Tires, rear	36x6
Boiler hp.	45
Two cylinder engine	
Final drive	worm

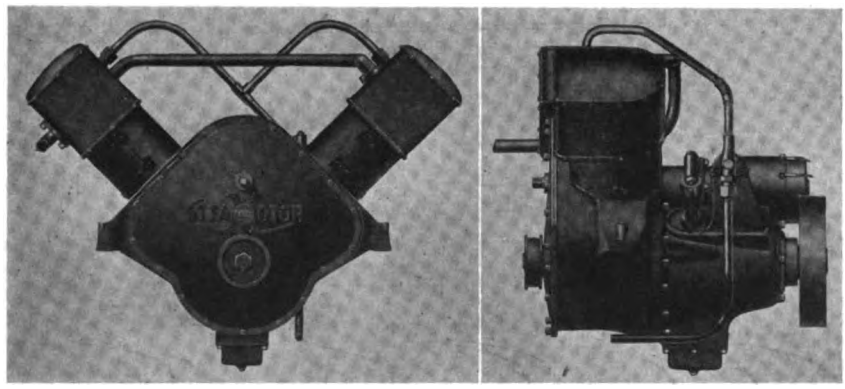
Kerosene is used for both starting and running. There is no pilot light, the burner being electrically ignited. The water for the combustion of the fuel is drawn through the radiator by a small electrically-driven multivane pump and passes the spray nozzle, as shown in an accompanying illustration, with sufficient velocity to draw out the kerosene and atomize it. The end of the pump discharge is a venturi-shaped tube which automatically reduces the velocity of the air due to the widening of the tube at the end, at which point it is lighted by an electric spark. Actual combustion takes place in the chamber beneath the boiler.

The Steamotor engine is of the two-cylinder, single-expansion, double-acting type, with the cylinders mounted at an angle of 90 deg. A slide valve is used on each cylinder for both the inlet and



Side and plan views of the 2-ton worm-driven Steamotor truck using the Doble steam powerplant. In the lower view the condenser is at the extreme left, then the boiler, followed by the water tank under the floorboards and the two-cylinder engine under the seat

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Front and side views of the Steamotor two-cylinder steam engine of the double-acting type in which the cylinders are set at 90 degrees. The electric generator is seen in the side view at the right

the exhaust. Each valve is actuated by means of a specially designed Stevenson link gear by which the engine may be reversed without additional devices. The cylinders are 4-in. bore and 4-in. stroke. The crankcase is made of an aluminum alloy casting that contains all of the moving parts of the engine except the pistons and valves. The crankshaft, which has one crank serving for both connecting rods, is counterbalanced to reduce vibration. The entire engine is fastened to the truck frame at three points to insure that any weaving of the frame will not affect the engine alignment.

The exhaust steam of the cylinders is carried to the top of the radiator or condenser and forced down through it by the pressure of the following steam. The water of condensation enters the water tank very near the bottom so that any steam left is at once condensed in bubbling up through the water. This will occur only when accelerating rapidly from a slow speed or pulling slowly on a heavy road. If these unfavorable conditions continue for some time, a small part of the steam will remain uncondensed, but the accumulation of any considerable amount is provided against by a small vent in the top of the tank. This method of condensation uses the water over and over again so that the truck will run several hundred miles on one tankful of water.

The lubrication of the throttle and cylinder valves, the cylinder walls and the interior of the boiler is accomplished by the addition of a small quantity of standard cylinder oil to the boiler water and pumped into the generator.

Kissel Offers New Five-Model Line and Convertible Cabs

CHARACTERIZED by the adoption of the new all-year-convertible cab, the new Kissel line consists of five models of ¾-, 1-, 2-, 4- and 5-ton capacities. The new convertible cabs, which were described at greater length in the July 1, 1917, issue of THE COMMERCIAL VEHICLE, are furnished as standard equipment on the four larger models except for the winter enclosure, which must be purchased extra. The new line contains one less model than was offered on the 1917 market and given in full in the specification issue of THE COMMERCIAL VEHICLE published on November 1, 1916. The model dropped is a 2½-tonner.

Along with the adoption of the convertible cab, the wheelbases of all of the five new models have been increased over those of the trucks which they have superseded. Similarly the price has been raised in each case, the old and new prices being as follows:

Model	Old Price	New Price
1,500 pound	$950	$1,085
2,000 pound	1,250	1,485
4,000 pound	1,875	2,100
8,000 pound	2,850	2,950
10,000 pound	3,350	3,750

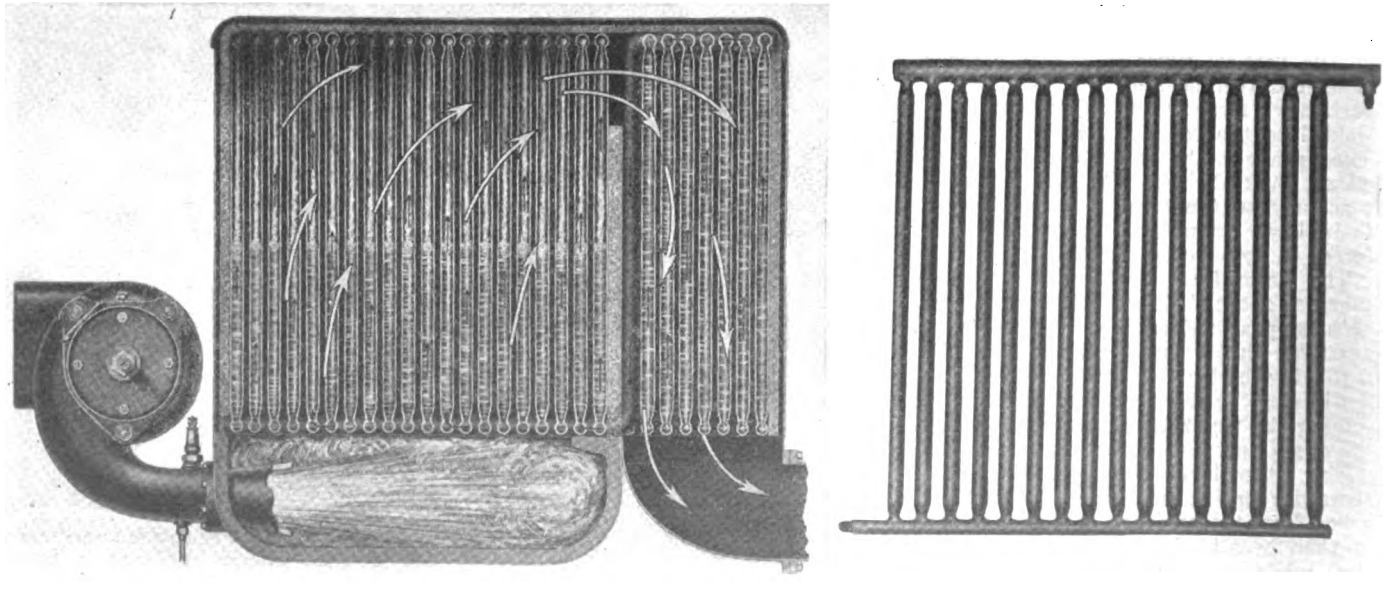
Except in price, the type of cab, wheelbase and the clear loading space for the body, the new line is practically identical with the models formerly offered.

The new ¾-tonner has had its wheelbase increased from 120 to 135 in. and now has a clear loading space for the body of 8 ft. instead of 6 ft. 3 in. as previously. This model is known as the Flyer and has a maximum chassis capacity of 2250 lbs., including the body.

The next size model, known as the General Utility, corresponds with the old 1-tonner, and has a loading space of 10 ft. instead of 8 ft., and an increased wheelbase of 152 in. instead of 132 in.

The Freighter, with a chassis capacity, including body, of 5200 lbs., has a 168-in. wheelbase instead of 144 in., as on the former 2-tonner. The loading space has also been increased from 10 ft. to 12 ft., and the size of the rear tires increased from 6 to 7 in., with the fronts increased from 3½ to 4 in.

The two largest models correspond respectively with the 4- and 5-ton models of early 1917. The smaller of the two, known as the Heavy Duty model, has a chassis capacity, including body, of 8600 lbs., with a 168-in. wheelbase and a 13-ft. loading space. The larger, called the Dreadnaught, is of 11,800 lbs. ca-



At the left, a sectional view of the Doble boiler, burner and burner air fan; at the right, one of the boiler tube elements

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pacity, including body, and has a 180-in. wheelbase and a 14-ft. loading space.

All five models have Kissel motors with the cylinders cast in block. The engines on the smaller models are alike. A 4¼ x 5½ engine with a rated S. A. E. horsepower of 29 is used on each of the three larger models. The valves are placed on the right in each case.

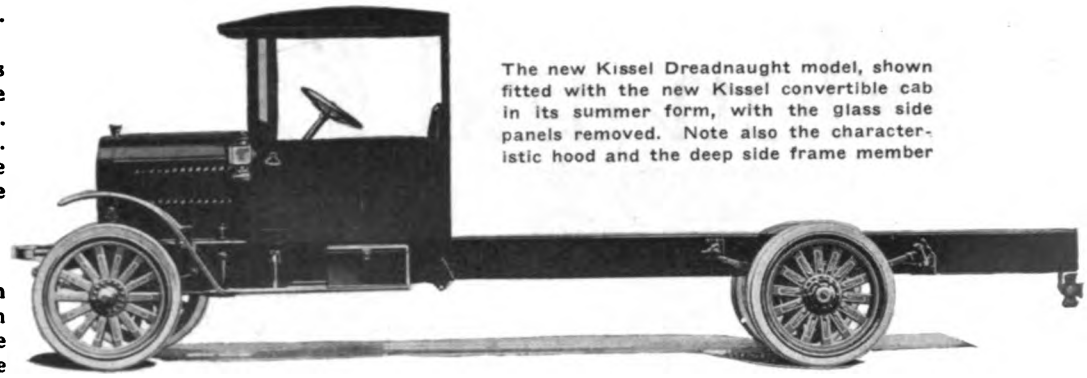
All Engines Water-Cooled

All the engines are water-cooled with centrifugal pumps used in connection with sheet-casing radiators with square tube cores. Eisemann magnetos are used on all models for ignition, which is of the single type with spark-advance control by hand. The two-unit starting and lighting system of Remy manufacture is offered as optional equipment at extra cost.

The engines in the three smaller units are mounted in unit powerplants, the two smaller ones employing cone clutches and three-speed selective gearsets, and the third a dry-plate clutch with a four-speed gearset. The two largest models have dry-plate clutches with four-speed selective gearsets mounted amidships.

Spiral Bevel Drive Used

Spiral bevel drive is used on the smallest model of the line, with worm drive on the other four units. Rear springs are mounted to take both the driving and propulsive stresses in all models of the line. Left steer and center control are similarly standard on all five units.



The new Kissel Dreadnaught model, shown fitted with the new Kissel convertible cab in its summer form, with the glass side panels removed. Note also the characteristic hood and the deep side frame member

Truck Hauls Huge Mirror to Mt. Wilson

(*Continued from page 25*)

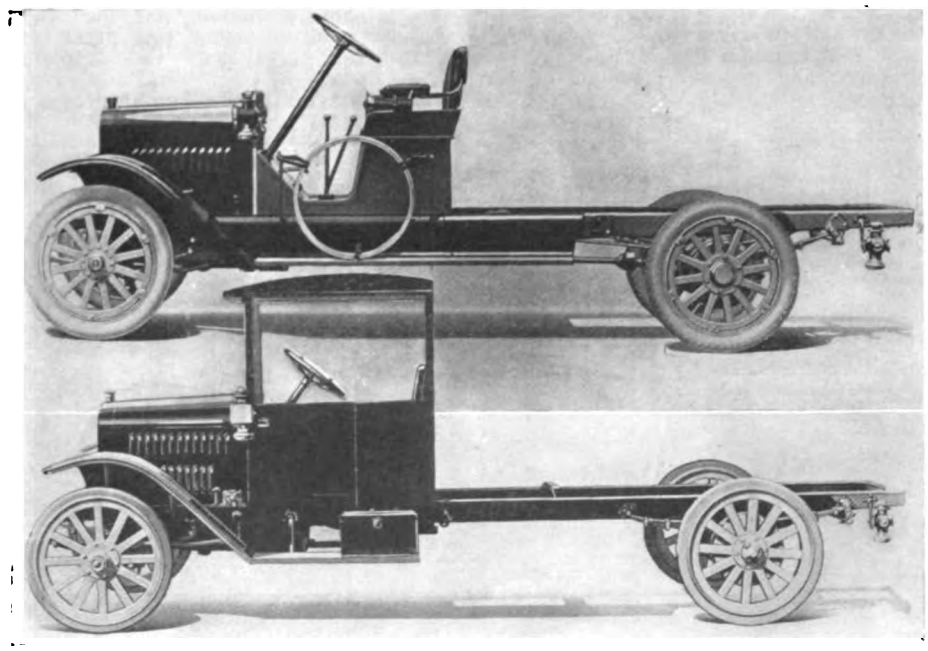
the dome after making the trip from the lower toll gate in less than 4 hr. running time.

This new observatory and its famous telescope will stand as a world's monument to the efficiency of motor transportation. There are 600 tons of steel within the structure that move at the touch of an electric switch. There is an additional 200 tons of steel in the base of the structure. The whole is inclosed with corrugated iron. Approximately 500 tons of cement have been used and there were additional hundreds of tons of wire cables and timbers used. Two individual sections of the telescope weigh more than 11 tons. Every pound of every kind of material and supplies was carried to the top on motor trucks. Superintendent Jones says that were it not for the part played by the trucks it probably would be 10 years more before the observatory would be in its present state of near completion. When a Saurer truck took a 13-ton load up in a single day, it was estimated that the block and tackle and donkey engine system would have required 2 years to do the same thing.

KISSELKAR SPECIFICATIONS

	1500 lbs.	2000 lbs.	4000 lbs.	8000 lbs.	10,000 lbs
Capacity					
Price	$1085	$1485	$2100	$2950	$3750
Wheelbase, in.	135	152	168	168	180
Tires, front	32x4*	34x3	34x4	36x5	36x4
Tires, rear	32x4*	34x4	36x7	36x5d	36x6d
Bore, in.	3⅞	3⅞	4¼	4¼	4¼
Stroke, in.	5½	5½	5½	5½	5½
N. A. C. C. hp.	24.22	24.22	29.00	29.00	29.00
Speed, r.p.m.	1200	1280	1295	1243	1198
Speed, m.p.h.	25	20	15	13	11
Gear ratio in high gear	4.58-1	6.50-1	8.50-1	10.25-1	11.66-1
Final drive	sp. bv.†	worm	worm	worm	worm

*Denotes pneumatic tires.
†Denotes spiral bevel.



At the top, the Flyer model of the Kissel line, and below, the General Utility model with the new convertible cab. The former has a chassis capacity of 2250 pounds, including body, and the latter, 3400 pounds

Book Reviews

"Lubricating Engineer's Handbook" is the title of a most exhaustive and thorough 333-page book by John Rome Battle on the subject of lubrication. It holds a wealth of information for the oil salesman, manager, designer, purchasing agent, operating engineer and mechanician. It first of all treats of the principle of friction, the theory of lubrication and the history of petroleum and then passes on to a description and discussion of petroleum lubricants and others, and gives valuable information as to the proper manner of conducting oil tests.

It also gives considerable information on oil data and conversion tables and useful engineering data on lubrication. It then treats of the proper lubricants for various forms of machinery, such as electrical equipment, steam engines of both the stationary and marine types, and includes two chapters devoted entirely to the lubrication of internal-combustion motors such as are used on motor trucks and the lubrication methods followed.

The book is well indexed, contains many half-tone and line-cut illustrations, and besides has more than a score of data and oil-test pages at the end.

It is published in a cloth binding by the J. B. Lippincott Co., Philadelphia, Pa., and sells at $4 the copy.

Packard Motor Trucks Escorted Uncle Sam when he took possession of the Virgin Islands, formerly the Danish West Indies. A detachment of the United States marine corps took formal possession of the islands as soon as the treasury warrant was handed over, accompanied by two Packard trucks.

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Men and Makers



FEDERAL MOTOR TRUCK CO. has contracted to produce $1,150,000 worth of trucks for the Thompson Auto Co., Detroit, to be delivered within the next 6 months.

Willys-Overland Co., Toledo, Ohio, handled 116,537 freight cars in its yards in 1916.

Old Reliable Motor Truck Co., Chicago, will build a two-story addition, 100 by 160 ft., to enlarge the plant at Michigan Avenue and Thirty-ninth Street.

Maxwell Motor Co. plans to spend $500,000 on the factory which it is now erecting at Windsor, Ont., Can. Two hundred men will start work in this factory as soon as the first building is completed and the working force at the Canadian plant will eventually reach the 1000 mark.

Autocar Co., Ardmore, Pa., is having plans prepared for a five-story reinforced concrete addition.

Packard Motor Car Co., Detroit, will erect a sales building of eight stories to cost $1,200,000.

Gersix Motor Car Co., Tacoma, Wash., has changed ownership and will hereafter maintain its main offices and factory in Seattle, Wash.

Hamilton Motor Co., Grand Haven, Mich., is planning to manufacture a light truck. It is now receiving equipment and expects to start active production shortly.

Racine Motor Truck Co., Racine, Wis., recently formed, will manufacture motor trucks.

Acason Motor Truck Co., Detroit, had a get-together meeting and dinner at the Log Cabin Inn, Detroit, on Monday evening, June 25.

Berwick Car Works, Mahanoy City, Pa., has produced an armored car for the United States Government which has been shipped to testing grounds at Sandy Hook, N. J.

F. X. Truck & Auto Co. of Canada, Ltd., Walkerville, Ont., has been incorporated with a capital stock of $45.000 by Stephen A. Griggs, Edwin H. Collins, Elihu C. Griggs and others, to manufacture motor trucks, motors, engines, parts and accessories.

Truck Engineering Co. has been formed in Cleveland, Ohio, to manufacture trucks of several models. The incorporators are A. V. Cannon, O. O. Vrooman, H. O. Mierke, R. T. Kelsey and Herbert A. Spring.

Trailer Truck Co., Nashotah, Wis., has been organized by L. E. Utter and Ralph Howland to manufacture and market a new type of adjustable trailer for haulage of all kinds of materials.

Killen-Strait Tractor Co., Appleton, Wis., is rushing work on a new foundry building in which it will manufacture henceforth all of the castings required in the making of its machines.

Rein Drive Tractors, Ltd., Toronto, Ont., has been formed with a capital of $5.000,000 by the following: H. M. Tandy, J. W. F. Kerr, W. A. MacFarlane.

Kardell Tractor & Truck Co. has opened offices in St. Louis, Mo., for the manufacture of the Kardell four-in-one tractor. This product may be used as a plow, tractor, truck or farm power engine.

The National Tractor & Plow Co., Carey, Ohio, has filed papers with the secretary of state increasing its authorized capital from $10,000 to $15,000.

Studebaker Corp. Branches have recently been established in Oklahoma City, Okla., and Joplin, Mo.

Harry Newman-Stratton Co., Detroit, has recently taken the distribution of Maxwell products for Illinois, part of Indiana, part of Iowa, and St. Louis, Mo.

Troy Motor Sales Co., Los Angeles, Cal., distributor of the Nash products, has been developing business among the Japanese residents of the Coast by employing George Kosugi as agent who can talk to the prospects in their own tongue. The company has made many sales among the truck gardeners in the suburbs of the city.

Henley-Kimball Co., Boston, Mass., which has the Hudson and Doble for New England, has taken on the Maxwell for Portland and Worcester.

New England Velie Co., Boston, Mass., has taken the agency for Rainier trucks for Massachusetts, and will market them in connection with the Velie line.

Boyer, Goode & Co., Ottawa, Ont., are representing the TracFord in the provinces of Ontario and Quebec.

Hinchcliffe Motor Co., Boston, Mass., has been appointed New England distributor for Kissel products.

Markel-Maxwell Co., Columbus, Ohio, a central Ohio distributor for the Smith Form-a-Truck Co., is now occupying new quarters at 165-167 North Fourth Street, which was formerly occupied by the Lawrence Motor Truck Co. H. R. Markel is treasurer and general manager of the company.

Racine Auto Tire Co., Racine, Wis., is planning the erection of a five-story plant which will have a capacity of 7500 tires daily. The factory will be 260 by 320 ft., built in units 60 ft. wide. From 3000 to 4000 men will be employed.

Amazon Rubber Co., Akron, Ohio, has installed a chemical laboratory in its plant for the purpose of making exhaustive experiments in rubber along new lines.

Federal Rubber Co., Milwaukee, Wis., has awarded contracts for another large addition to its tire plant in Cudahy, Milwaukee County, to cost about $75,000. The new building will be 6 stories high, 45 by 300 ft., and of fireproof construction.

Polack Tyre & Rubber Co., New York, reports that nearly 100 per cent of its working force are Liberty bond holders.

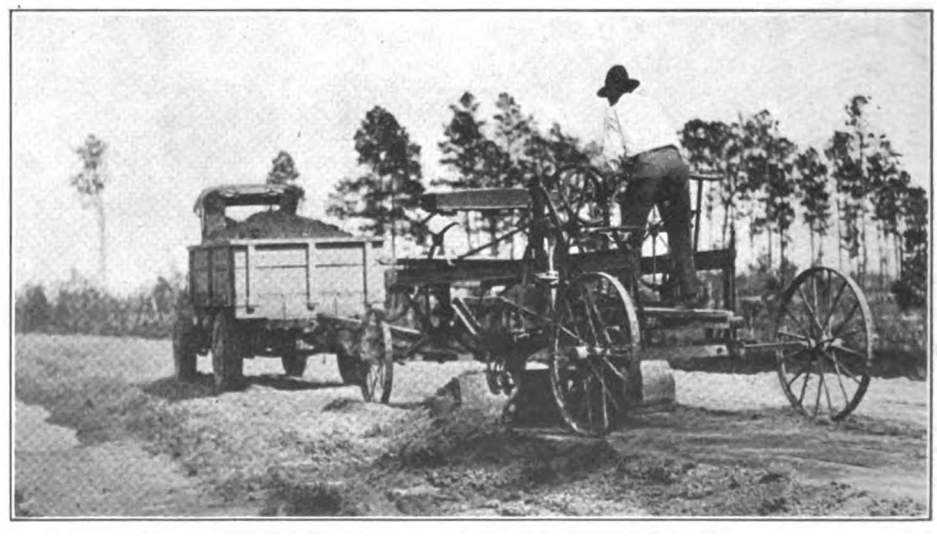
Fabricord Tire Co. of Canada, Ltd., Toronto, Ont., has been granted a charter. The incorporators are: A. L. Reid, K. D. MacKenzie and W. W. Perry. The capitalization is $1,500,000.

Chelsea Truck Wagon Works has leased for a period of 10 years the buildings at 440-42 West Twenty-seventh Street, New York.

Continental Motors Co. will make truck engines as well as passenger car engines at its Detroit plant in the future. Hitherto all the truck engines have been turned out at the Muskegon factory.

Morgan Potter Motor Co., Beacon, N. Y., will confine its manufacturing activities for the present to its line of truck brakes. It recently changed its name from the Morgan Potter Mfg. Co., with the announced intention of making motor vehicles, but the company has since stated that the announcement was premature.

Appleton Auto Body Co., Appleton, Wis., maker of commercial bodies and truck units for Fords, has outgrown its



This Duplex four-wheel-driven truck is hauling 3½ cu. yd. of gravel and pulling a grader which is cutting 3 in. into the road on one side and 5 in. on the other. F. A. Albee, Natalbarry, La., who owns the outfit, says that roads can be constructed 50 per cent more economically by using this type of traction in preference to mules

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This is an example of the farming idea carried to its logical conclusion. First backyard cultivation became popular, then neighborhood co-operation or community fields gained favor, and the two trucks in the picture are helping neither themselves nor their neighbors, but strangers. The vehicles, loaded with a tractor and plows, are G.M.C. trucks owned by W. C. Durant, president of General Motors. He is sending them out on the highways of New York and New Jersey, giving the farmers free lifts with their planting, a novel illustration of what F. P. A. would call "potatriotism."

present plant and is now making arrangements for the erection of new works during the fall and winter.

Silvex Co., South Bethlehem, Pa., has purchased 10 acres of land and will erect a plant which is expected to have a capacity of 12,000,000 spark plugs yearly.

Hayes Motor Truck Wheel Co., St. Johns, Mich., is planning to increase the production of its plant from 100 to 500 sets of truck wheels per day and will erect new buildings, install new machinery, and double the force of employees, besides operating night shifts.

Duplex Engine Governor Co., Brooklyn, N. Y., has moved its Chicago office from the Mallers Building to 2015 So. Michigan Avenue.

American Chain Co., New York, has rearranged its list prices and discounts on its hammer-lock self-spreading cotter-pin. The larger sizes are lower in price than before and the lighter sizes higher.

Standard Parts Co., Cleveland, Ohio, during the first 26 days of June increased its sales 25 per cent over the corresponding period in May.

Lasure Clutch Co., Madison, Wis., maker of friction clutches for gasoline engines of all kinds, has decided to move its plant and equipment to Watertown, Wis., where local capital has taken a large block of stock and furnished a suitable factory building. The change of location will take place in the immediate future.

Krom-nik Gear Co., Chicago, Ill., has been organized to market Anderson rolled gears and M. & S. differentials.

Federal Engineering Co., Toronto, Ont., has been appointed Canadian representative of the Buda Co., Chicago, Ill.

Kelsey Wheel Co., Detroit, now has its preferred and common stock listed on the New York Stock Exchange to the extent of $2,010,100 of 7 per cent cumulative preferred and $8,385,300 common.

Universal Valve Co., Chicago, has removed its general offices to Burlington, Wis., where its products have been manufactured for a number of years by the Burlington Brass Co. The change is made because of the greater convenience in having the production and marketing ends of the business in one location.

Miller Rubber Home & Land Co., Akron, Ohio, has been formed to aid employees of the Miller organization in securing homes.

Ford English School, Detroit, conducted by the Ford Motor Co., held its fourth graduation exercises on Independence Day. At this time 400 foreigners were graduated from the school with a good working knowledge of the English language. The school aids the newcomers to the United States in qualifying for naturalization papers.

Fred Cardaway has been appointed manager of the export department of the Packard Motor Car Co. He made a trip last winter to South America, establishing dealerships in Rio de Janeiro, Buenos Aires and Montevideo.

R. L. Saunders has become general manager of the Gersix Motor Car Co., Tacoma, Wash. He was formerly vice-president and sales manager of the company.

H. H. Howe, sales manager of the Acason Motor Truck Co., has just completed a trip covering Indianapolis, Ind., Omaha, Neb., Kansas City, Mo., St. Louis, Mo., and Minneapolis, Minn., and shipments of Acason trucks are now on the factory schedule for all these points.

Lafayette Markle has become vice-president and assistant general manager of the Republic Motor Truck Co., Alma, Mich. Mr. Markle has been in the motor vehicle business since 1899, having been associated with Oldsmobile, Buick and Studebaker. He organized the L. Markle Co., of Chicago, to handle Studebaker business in that city, and has resigned the presidency of that organization to accept the Republic position.

Robert S. Stewart and Forrest J. Alvin have assumed more responsible positions than before in the United States Motor Truck Co. organization. Mr. Stewart, formerly and now vice-president of the company, has been made executive officer in charge of the firm. Mr. Alvin is to be general manager and director of sales, and all orders or business reports regarding the affairs of the company are to pass through his hands. Mr. Alvin has been general sales manager. President R. C. Stewart, of the company, has delegated his executive authority in order to devote his energies to the Stewart Iron Works, of which the truck company is a subsidiary.

John N. Willys, president of the Willys-Overland Co., has been elected a member of the voting trust of the Curtiss Aeroplane & Motor Corp., succeeding James Imbrie, resigned.

J. E. Keepperley, vice-president of the Willys-Overland Co., has been elected a director of the Curtiss Aeroplane & Motor Corp. to succeed G. Meyer.

F. H. Thompson has been appointed general traffic manager of the Willys-Overland Co., Toledo, Ohio, succeeding C. W. Eggers.

Paul A. Smith, recently with the Willys-Overland Co., Toledo, Ohio, has been appointed general manager of the Overland Automobile Co., St. Louis, Mo.

Eugene Prince has allied himself with the United States diplomatic mission to Russia, headed by Elihu Root. Mr. Prince was formerly factory representative of Willys-Overland in Russia.

F. S. Rockwell has been appointed general sales manager of the Standard Motor Truck Co., Detroit, Mich.

D. McCall White, formerly chief engineer of the Cadillac Motor Car Co., has been appointed consulting engineer of the General Motors Co. and will work in all General Motors divisions.

Fred Erickson has been made chief engineer of the American Motor Truck Co., Detroit. Mr. Erickson was formerly chief engineer of the United Motor Co., Grand Rapids, Mich.

Hermann Hill has been appointed mechanical engineer of the Empire Axle Co., Dunkirk, N. Y. He was formerly chief engineer and production manager of the Niles Car Mfg. Co.

C. A. Tilt, president of the Diamond-T Motor Car Co., recently gave a housewarming in the assembly room of the company's new factory. About 100 guests enjoyed a beefsteak dinner and a tour of the plant.

H. L. Thompson has been placed at the head of the research department of the Moline Plow & Tractor Co. He was formerly professor of farm engineering at the Oklahoma Agricultural College.

O. M. Stowe, Moline, Ill., has been appointed manager of the 3 P Tractor Co., Davenport, Iowa. This company was recently organized with a capital stock of $50,000 and will manufacture a tractor attachment for Ford cars.

L. L. Boyer has been appointed sales manager of the Studebaker branch at Atlanta, Ga.

L. Percy Kilbourn, retail sales manager of George W. Browne, Automobiles, Inc., Milwaukee, Wis., distributor of Willys-Overland products, has been made manager of the Madison-Overland Co., Madison, Wis.

C. E. Reynard and Leonard T. Smith have been appointed representatives of the Lawrence Motor Co., Columbus, Ohio, central Ohio distributor of Republic and Vim trucks. Mr. Reynard will have charge of the outside territorial organization, and Mr. Smith will handle the agency at Springfield, Ohio.

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W. R. Angell has been elected secretary of the Continental Motors Corp., Detroit. He has been a practising lawyer in Chicago for the past 20 years, and he will relieve A. H. Zimmerman, secretary-treasurer of the company, of half the duties of that office which had become too numerous for one man to handle.

L. J. Kaiser, Detroit, has become vice-president and sales manager of the Royal Motors Corp., manufacturer of a one-ton Ford truck attachment. Mr. Kaiser was formerly in the furniture business.

E. D. Winans has been appointed supervisor of the New England territory for the Ajax Rubber Co., with headquarters in Boston, Mass.

Lewis H. Scurlock, J. W. Fulton and **J. S. Houston** are president, vice-president and secretary-treasurer. respectively, of the recently formed Krom-nik Gear Co., Chicago. Mr. Scurlock has been organizer of the M. & S. Corp., whose products the new company will distribute, and still retains his interests in the organization.

W. J. Baumgartner, formerly assistant chief engineer of the Sheldon Axle Co., of Wilkes-Barre, Pa., has been appointed to the position of chief engineer of the Duplex Engine Governor Co., Inc., Brooklyn, N. Y.

Samuel Lindsay Nicholson has been appointed assistant to the vice-president of the Westinghouse Electric & Mfg. Co., with headquarters at East Pittsburgh, Pa. He has been sales manager of the company since 1909.

G. T. McFarland has been made manager of the Brooklyn, N. Y., branch of the P. J. Durham Co., battery service station for Westinghouse, Auto-Lite, Bijur, Gray & Davis and U. S. L.

Alfred P. Sloan, Jr., president of the United Motors Corp, has taken over the management of the Perlman Rim Corp. Heretofore Mr. Sloan had no connection with the company, which was under the direction of L. H. Perlman, now retired.

Clarence M. Day has been elected president of the Perlman Rim Corp., representing the interests of Alfred P. Sloan, Jr., in the organization.

R. B. Dickson has been appointed division manager of the Indianapolis territory for Prest-O-Lite, with headquarters at Indianapolis, Ind. He was formerly battery service station supervisor for the company in Detroit.

D. B. Mugan has been appointed resident manager of the Edison Storage Battery Supply Co., with headquarters at 201 Baronne Street, New Orleans. He was formerly associated with the Illinois Central Railroad Co., in charge of their electrical department at New Orleans, La.

H. L. Arbogast has been placed in charge of the new experimental chemical laboratory of the Amazon Rubber Co., at Akron, Ohio.

E. W. Anstead, connected with the Hess Spring & Axle Co., the Lexington-Howard Co., and many other motor vehicle organizations, died recently at Connersville, Ind.

Ralph D. Mock, treasurer of the Hydraulic Pressed Steel Co., Cleveland, Ohio, has been elected a director.

Berry Rockwell has been made general sales manager of the Smith Motor Truck Corp. He was formerly with the McAvoy Advertising Agency in Chicago.

Cornelius T. Myers, consulting engineer, has been appointed chairman of the chassis builders' committee in Washington, D. C., for the standardization of the Class A army motor truck. Mr. Myers is now working on a design to be submitted to a conference of United States Army officers and motor truck manufacturers.



Frequenters of Greenwich Village are pleased to scoff at the commercial as opposed to the artistic life; yet without the use of a commercial vehicle there would have been no Titanic Memorial statue at the Independent Artists' Exhibit in the Grand Central Palace in New York this spring. This 6-ton piece of sculpture by Mrs. Harry Payne Whitney was hauled from Quincy, Mass., to New York City on a 5-ton Packard after the railroad refused to take it because of its size and weight, it being 14 ft. high and 13 ft. wide

Merrill C. Horine has received an appointment as inspector of airplanes and airplane engines in the Airplane Engineering Division of the Signal Corps. He was formerly editor of THE COMMERCIAL VEHICLE, and will co-operate with Arthur J. Slade in working out some of the details of the motor transport equipment of the Balloon and Airplane Company now being put in readiness.

Benjamin F. Yoakum, railroad financier, has purchased a half interest in the Louis Enright gasoline substitute invention, which received much publicity a year ago, due to the fact that the inventor claimed that it could be marketed at a cent a gallon. The delay in manufacturing the substitute, it is claimed, is due to a year's option on the invention held by the Maxim Munitions Corp.

No More Penitentiary Trucks are to be made at Columbus, Ohio, for the present. H. S. Riddle, of the board of administration of the institution, has stated that it was impossible for the prison authorities to get parts for assembly. The convicts have turned out about two dozen heavy duty trucks for state use during the past 2 years.

American Motor Vehicles in Australia have been greatly increasing in number during the past two years. The value of the chassis imports in 1915 was $1,812,912, and $4,749,104 in 1916. New South Wales took a heavy proportion of these imports, the total value for this province being $712,791 in 1915 and $1,965,695 in 1916.

Electric Current by Kissel Truck Power has been furnished for the United States army cantonment at Linda Vista, Cal., for as much as a week at a time. Trouble developed in the electric lighting system which shut off all power and left the army post in darkness. A stock Kissel truck was attached to the dynamo by a belt to relieve the situation.

Packard Truck Salesmen Attend Classes organized by the company which aim to instruct them not alone in the selling art, but in the details of the service which the Packard line may be expected to render. The salesman learns the adaptability of the truck to special lines of service, its future possibilities. how to figure hauling costs, and the history and scope of the Packard company. The salesmen are told to urge men who have a hauling problem to bring it to the company for solution without being obligated in any way to buy a Packard vehicle.

"Friendly Touch" is a booklet published by the Black & Decker Mfg. Co., New York. displaying its line of Lectro-flater air compressors and portable electric drills. The title is derived from the "touch" that the customer inflicts on the garageman by making use of the free air privilege.

"Norma—In the National Service" is the title of a folder issued by the Norma Co. of America, New York, describing briefly the uses for Norma ball bearings in magnetos and lighting generators in trucks, airplanes, tractors and water craft.

A Denmark Truck Agency would like to handle a truck line not already represented in that country. Particulars may be obtained by writing to the bureau of foreign and domestic commerce, Washington, D. C.

Motor Truck Fees in New Brunswick, Can., have been increased so that a commercial vehicle under 2 tons must pay $10, and $5 per ton additional is charged for each 2000 lb. or fraction thereof in excess of 2 tons.

K. H. Dresser, formerly manager of the Springfield, Mass., branch of the Goodyear Tire & Rubber Co., Akron, Ohio, has been transferred to Akron, and succeeded by R. E. Lane.

Prest-O-Lite Co. Employees have to date bought $84,350 worth of Liberty Bonds. The company offered to pay its employees 1½ per cent interest on the Liberty Bonds they purchased in addition to the 3½ per cent paid by the government. The bonus offer was limited to $250 for any one person.

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WHITE TRUCKS

MANY White Trucks have been in service continuously since 1910—and have mileage records well above the hundred thousand mark. These examples of the permanency of White construction are the foundations of White Leadership in the Motor Truck Industry.

THE WHITE COMPANY

CLEVELAND

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The Importance of Being Right

THE selection of motor truck equipment for your business is essential to proper efficiency and economy. The selection of the particular type of motor truck you will use involves the same serious consideration as the selection of any other feature of equipment in your business.

It must be based on proved results—upon proved constructional merit—upon a record of achievement spread over a sufficient term of years to guarantee satisfactory performance to you.

Logical selection confines you to the Dominant Ten manufacturers of motor trucks, whose products exceed in numbers used that of all other truck manufacturers combined.

Among these Dominant Ten, Service Motor Trucks show indisputable constructional advantages combining the accepted features of design which are common to the Dominant Ten with certain individual features adding to strength, excess load carrying capacity, operating economy and availability for their particular work.

Send for these booklets:
Catalog
The Service 13 Pointer
Specialized Folder

Service Motor Trucks are furnished in six chassis types. Each type presents highly individualized construction adapting it in the fullest degree to the work it is called upon to do.

Seven years of manufacturing prestige with a constantly increasing volume of business, and a record of re-sales to satisfied owners unexcelled in the motor truck industry, are your guarantee of satisfaction.

Prices—All Models

1	ton truck	$1500
1½	ton truck	2200
2	ton truck	2500
3½	ton truck	3300
3½	ton truck (Special Contractors)	3600
5	ton truck	4300

Prices subject to change without notice

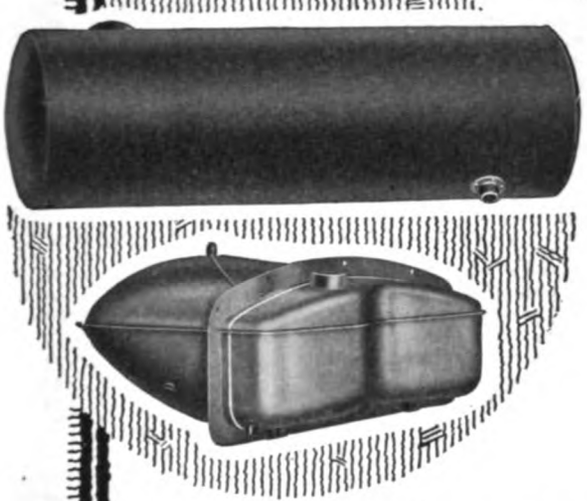
Service Motor Truck Co., Dept. V-7 **Main Office and Factory: Wabash, Ind.**

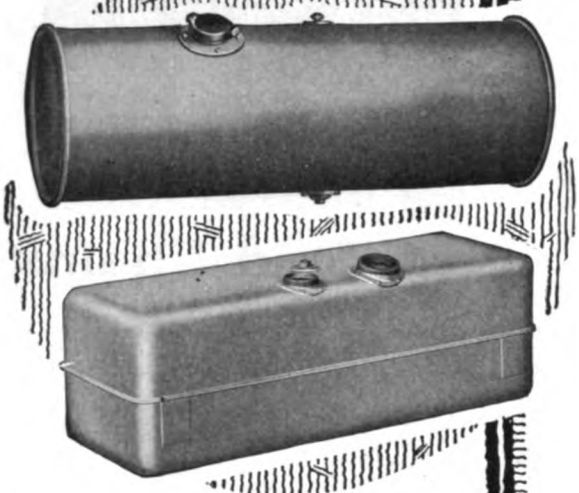
Chicago, Illinois	Boston, Mass.	Youngstown, Ohio	Baltimore, Md.	Hoboken, N. J.	Tulsa, Okla.
New York, N. Y.	Brooklyn, N. Y.	Canton, Ohio	Columbus, Ohio	Philadelphia, Pa.	Detroit, Mich.
Norfolk, Va.	Newark, N. J.	Pittsburgh, Pa.	Cincinnati, Ohio	Rochester, N. Y.	Denver, Colo.
St. Louis, Mo.	Indianapolis, Ind.	Milwaukee, Wis.	Washington, D. C.	South Bend, Ind.	Knoxville, Tenn.
Louisville, Ky.	Buffalo, N. Y.	Bridgeport, Conn.	Savannah, Ga.	Dayton, Ohio	Memphis, Tenn.
Omaha, Neb.	Salt Lake City, Utah	Des Moines, Iowa	New Orleans, La.	Nashville, Tenn.	Birmingham, Ala.



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... MADE TO YOUR ... SPECIFICATIONS





In our special tank department we make all types of gasoline tanks, welded or lock-seamed—build them to your particular requirements. Many large automobile manufacturers come to us because they know that G. P. & F. Tanks are of dependable quality, equal to the high standard of their own product. In addition to this they have found that

G.P.&F. SERVICE
"KNOWING HOW SINCE '81"

means prompt deliveries and reasonable prices, effecting worth-while economies in the cost of their completed product.

It is very likely that you, too, can enlist G. P. & F. Service to your advantage. The buying and manufacturing facilities of our large plant, covering 15 acres, together with our 36 years of experience in making pressed steel parts, are at your service.

Send blue-print or sample or give us specifications on the kind of tank you require, and let us submit figures.

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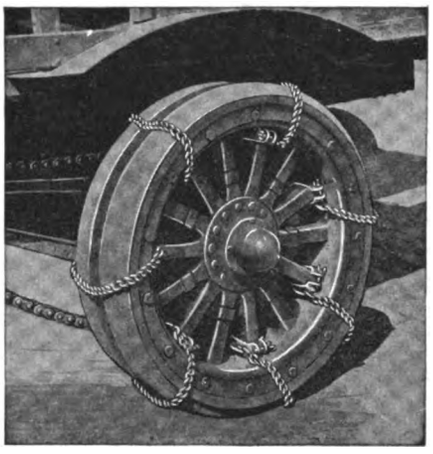
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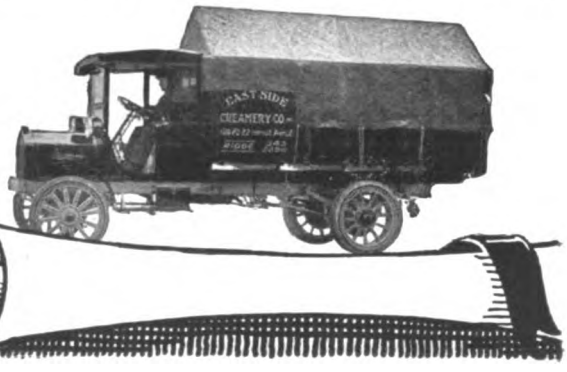
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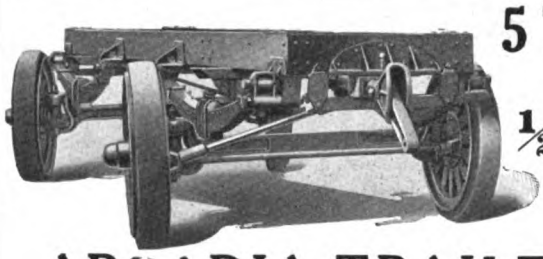
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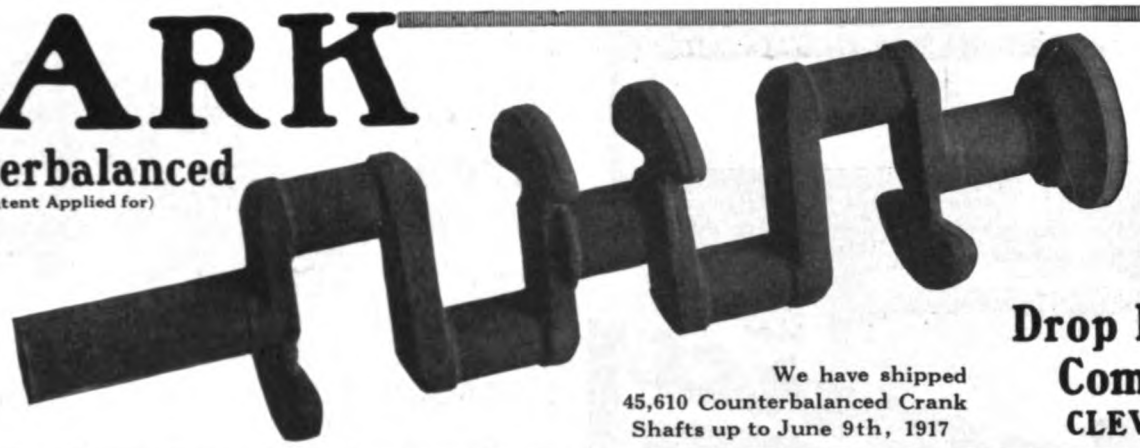
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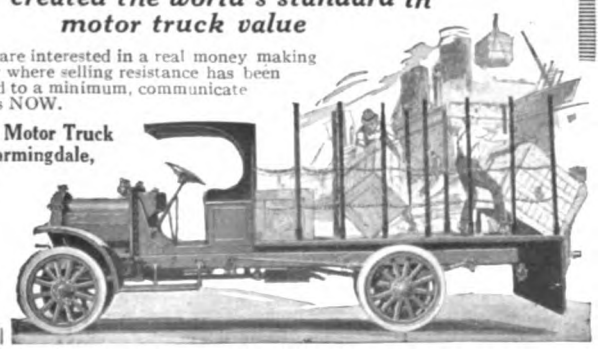
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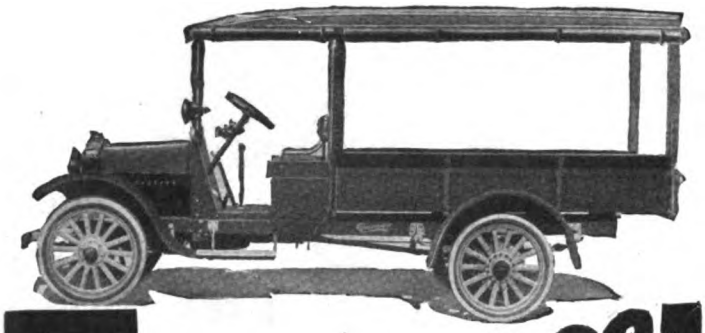
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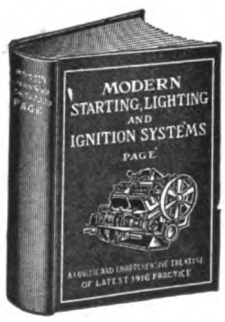
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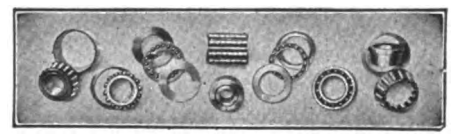
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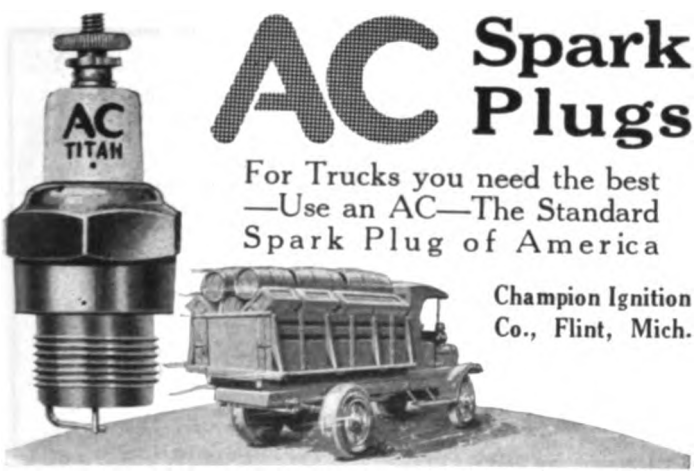
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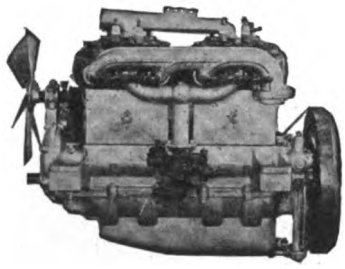
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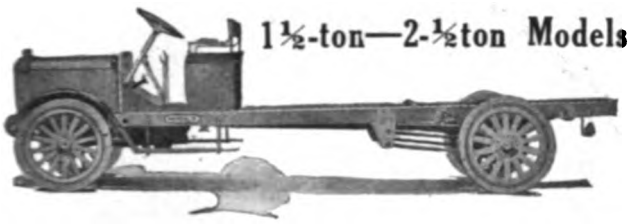
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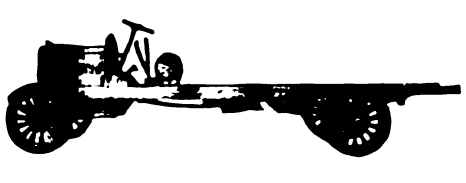
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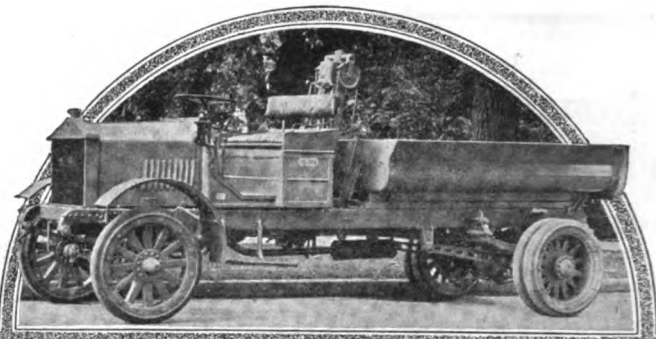
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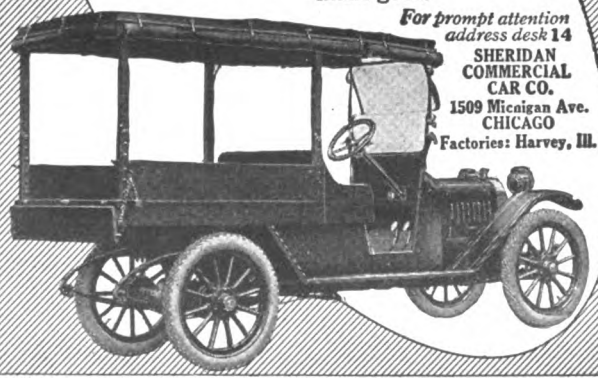
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Factories: Harvey, Ill.

Heavy Duty Truck Frames

Our Heavy Duty Truck Frames are especially designed for severe and unusual service. These are frames you want if you build a high grade truck. They live up to every claim we make for them.

Added capacities together with latest type equipment enable our assuring you of satisfactory service.

Our engineers are at your service, and we solicit your inquiries.

Savage Arms Corp.,
Formerly
Driggs-Seabury Ordnance Co.
Sharon, Penna.

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—Sheldon Springs—

Designing a truck presents no nicer problem than that of providing it with springs.

No concern in the world is as well prepared to solve this problem—none with the amount of experience—none with the varied experience—none with the facilities and equipment, either human or mechanical, that the Sheldon Axle and Spring Co. offers.

Collectively—these facts are the reason why the service Sheldon Springs will give is a known quantity and a guaranteed quantity.

SHELDON AXLE and SPRING COMPANY

Wilkes-Barre, Pa.

Makers of Springs and Axles for Heavy Duty Service for more than 50 years.

Chicago: 122 S. Michigan Blvd. San Francisco: 444 Market St. Detroit: 1215 Woodward Ave.

PIERCE Governors



Guarantee Motor Truck Efficiency

Owners of motor trucks are learning from experience that the only proper way to judge any truck is to take into consideration cost of upkeep, cost of operation, and performance—three features which are vitally dependent upon the governor. A thoroughly reliable governor will eliminate 75% of the usual repairs, reduce consumption of gas and oil, and keep the truck always ready to do the owner's bidding.

One Truck on the Job Is Worth Ten in the Repair Shop

The Pierce Governor, through its automatic and perfect control of the motor, prevents the troubles that put trucks in the repair shop. Supplies just the right amount of vapor to the motor, permitting the driver to get full power at all speeds up to the danger point, and shuts off the power when that point has been reached.

Can be adjusted for any desired speed.

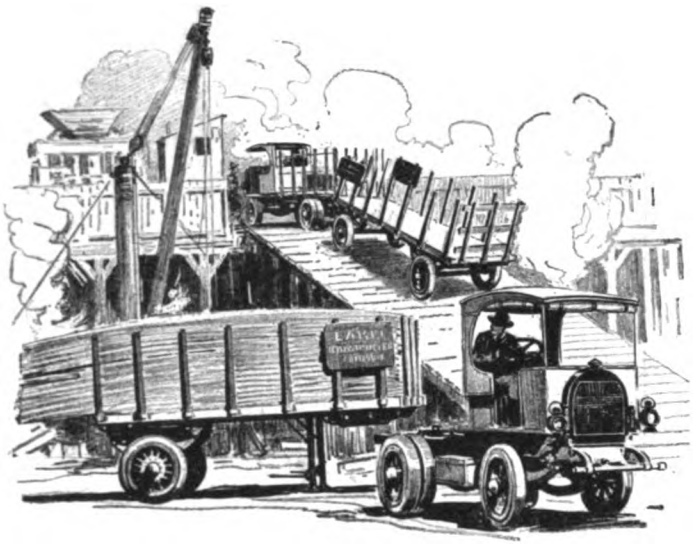
Used by 57 Prominent Truck Manufacturers
Demand a Pierce Governor on the truck you buy

PIERCE GOVERNOR COMPANY

World's Largest Governor Builders.

ANDERSON, INDIANA, U.S.A.

WATSON TRAILERS and SEMI-TRAILERS



THE *unusual* load, the *extraordinary* hauling job, the *big tonnage* proposition—those are the things mastered by the Watson line of Trailers, Semi-Trailers, and Chasses for Special Bodies.

Whatever the *load*, whatever the *road*, whatever the *business*, whatever the haulage *need*, the Watson line stands head and shoulders above everything of its kind in the hauling world in point of *service, strength, flexibility,* and *endurance.* Option of steel or rubber tires.

DEALERS—Why dally along with commonplace equipment when the Watson products put *big* business within easy reach? Wire *today* for territorial arrangements and profit plan particulars.

Send for special Watson Trailer and Semi-Trailer literature

WATSON WAGON COMPANY

(Largest Manufacturers of Bottom Dump Wagons in the World)

45 Center Street, Canastota, N. Y.

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THE MARK OF A BETTER RADIATOR

G & O
Radiators
for
Heavy
Duty
Service

The G & O Mfg. Co.
New Haven Connecticut

MACCAR

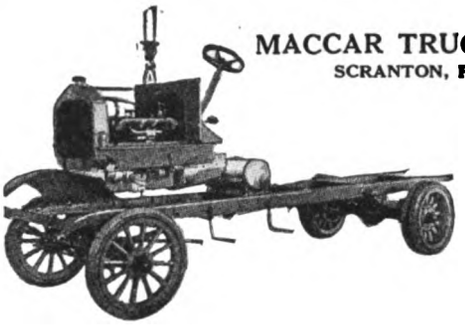
Delays Cost Money

The MACCAR never stays off the road more than 30 minutes, because of power-plant trouble.

If anything happens you substitute a new power-plant—no expensive tying up of your truck for time-consuming repairs.

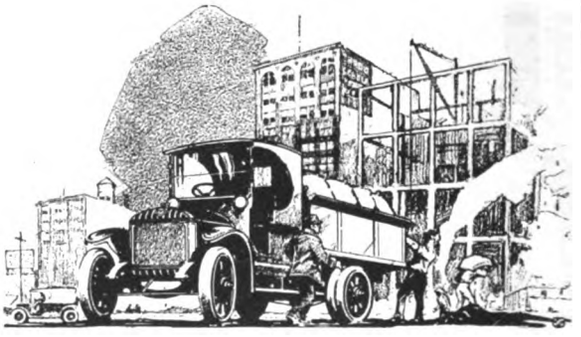
The motor, clutch, transmission, radiator, pump, magneto, carburetor, dash and toe boards, brake and foot pedals, steering gear and all spark and throttle controls, are assembled dust-proof, in one cradle and as a Unit mounted into the frame.

Dealers will find in the MACCAR AGENCY a new and profitable proposition. Write now for details.



MACCAR TRUCK CO.
SCRANTON, PA.

DIAMOND "T"



A Truck That Has PROVED Its Merit

Under the severest tests, with the hardest usage, even abuse, Diamond T Trucks have demonstrated beyond question their high quality construction, their absolute dependability and matchless fuel economy.

Ask any Diamond T user, for Diamond T rests its case with them. Write us today for complete information.

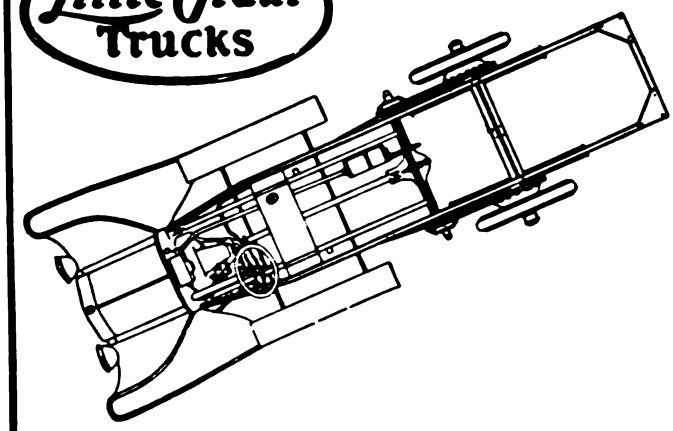
DIAMOND T MOTOR CAR COMPANY
Chicago, Ill.

5 MODELS
All Worm Driven

1 Ton, 1½ Ton, 2 Ton,
3½ Ton, 5 Ton Capacity

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Little Giant Trucks



LITTLE GIANT CONVERT-A-CAR

converts the Ford, old or new, into a *real* 1-ton truck. The specifications prove it. Made by the makers of the Little Giant line —1-ton, 2-ton, 3½-ton trucks. A new exclusive selling feature is the Hydro-Pneumatic Gas Generator, which cuts fuel cost in two. It is the year's

Biggest Profit Opportunity

Dealers: Write TO-DAY

CHICAGO PNEUMATIC TOOL CO.

615 Little Giant Building CHICAGO

Branches and Service Stations Everywhere

FULLER

Unit Power

TRANSMISSIONS

Give your customers a guarantee of satisfaction in their clutch and transmission by using only the best. FULLER transmission is approaching as rapidly as possible an ideal of perfection, of 100% efficiency of continuous service day in and day out, of no repair expense, no trouble, no lay up and no lost time. It's an Ideal worth working for and an ever-increasing list of customers gives us the satisfaction of knowing we are approaching that Ideal.

Look for the name FULLER.



Eastern Representatives
EARLE & BOGGS
1790 Broadway, N. Y. C.

FULLER & SONS MFG. CO.
Kalamazoo, Mich.

POLACK TYRES

"The highest priced tire in America"

It is true that Polack European Profile tires are "the highest priced tires in America", but that is because the quality, safety and **volume of rubber** makes the higher price necessary.



But in **cost per mile** and length of easy riding service, Polacks are cheapest.

Polack S.A.E. Tires, of the same **quality** but less in **volume** than the European Standard, may be had at competitive prices.

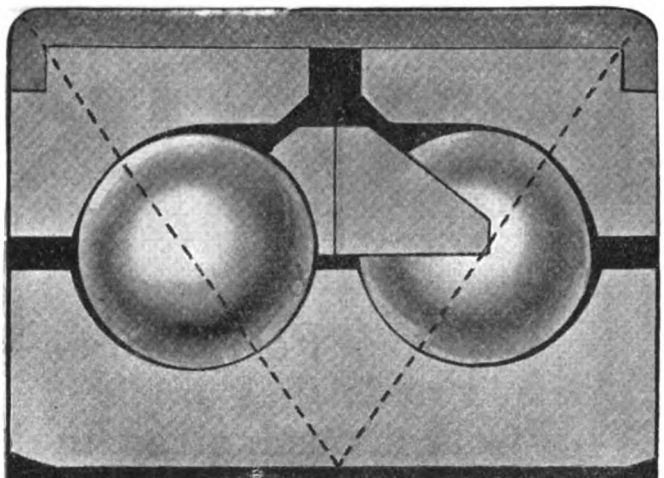
But if you desire tires, the quality of which is in perfect keeping with your high grade trucks, specify Polack European Standard (high profile) tires.

POLACK TYRE & RUBBER CO.

1876 BROADWAY NEW YORK CITY

Branches and Service Stations in principal cities

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Three in One

THE first ball bearing to do successfully the work of a radial and two thrust bearings — the New Departure "Double Row."

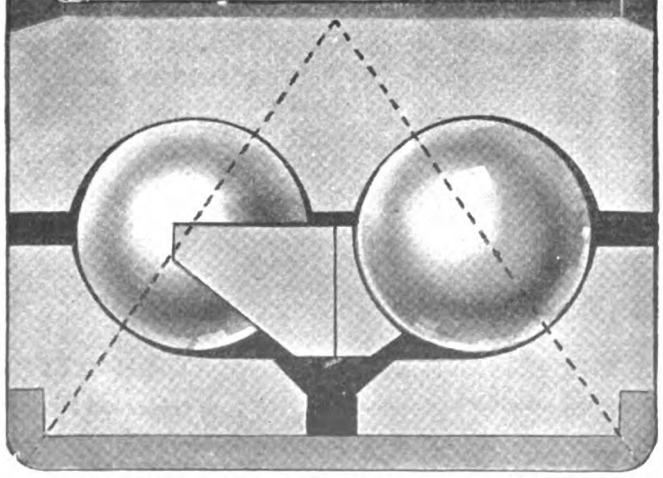
It carries loads from any and all directions, economizes cost, space, time and labor of assembly — and is permanently in correct adjustment.

In general use in American motor cars of all types and load ratings.

Have you a copy of the "Brown Book," describing the full New Departure line—double row, single row, and radax ball bearings?

THE NEW DEPARTURE MFG. CO.
Bristol Connecticut

NEW DEPARTURE BALL BEARINGS



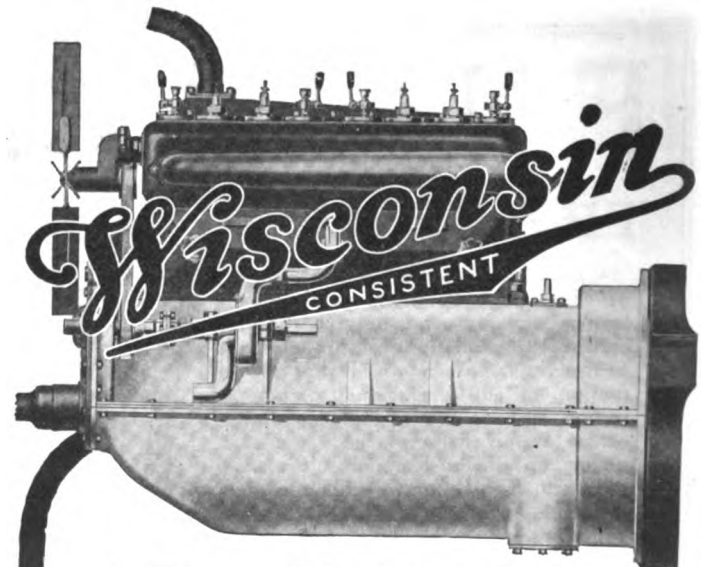
GMC
GENERAL MOTORS COMPANY
TRUCKS

This trade mark stands for a complete line of trucks *built in worm and chain drive* to meet the varied demands of city and country work—a truck to fit your business.

Send for catalogues today

GENERAL MOTORS TRUCK COMPANY
One of the Units of General Motors Co.
Pontiac, Michigan

Branches and Distributors in principal cities (84)



A Record Behind Them

Holding many records on road and speedway and distinguished for consistent performance in trucking service, WISCONSIN MOTORS have a reputation which its manufacturers cannot afford to take chances with. This far-reaching and enviable reputation means your protection—an assurance that the same high quality of materials and workmanship will always be maintained in the production of WISCONSIN MOTORS.

Write for specifications.

Wisconsin Motor Mfg. Co.
Sta. A-Dept. 319 Milwaukee, Wis.

New York Branch: 21 Park Row, T. M. Fenner, Factory Representative.
Pacific Coast Distributor: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles St., Los Angeles, Cal.

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A MARK of distinction symbolizing super-quality, strength and endurance in truck tires that are making history.

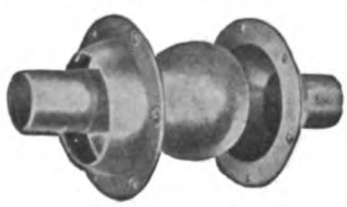
Buy Indians and insure the utmost returns from your truck tire investment.

INDIAN TIRE & RUBBER CO.

NEW BRUNSWICK NEW JERSEY

BOSSERT

In the most perfect plant that brains, money and experience could devise, we have the men and equipment to produce pressed steel parts in any quantity on comparatively short notice. We make more than 200 pressed steel parts and you can make your vehicles lighter and at lower cost, without sacrificing strength if you use *pressed steel* spring hangers, axle housings, running boards, brake drums, etc., instead of malleable iron, steel castings and drop forgings.



"THE BOSSERT WAY"

stands for the prompt delivery of your order filled in accordance with every item of the specifications



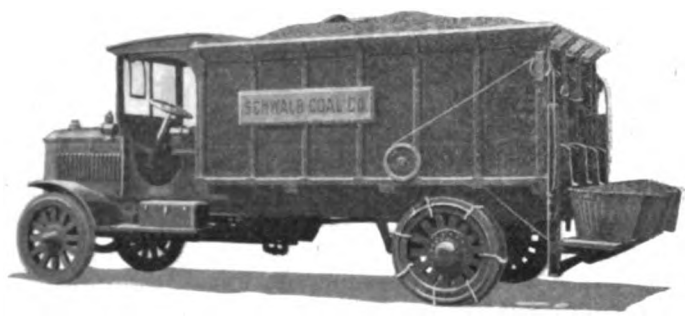
THE BOSSERT CORPORATION

UTICA, N. Y.

WHY 35 HEAD OF HORSES WILL BE REPLACED BY

ARMLEDER
Motor Trucks

IN THE SERVICE OF THE SCHWALB COAL CO.



A letter from the Schwalb Coal Company, Rochester, N. Y., to The O. Armleder Co.

Gentlemen:

We have at present four Armleder trucks in service. Two of these trucks we have had about one year. They have not lost a minute since the day they were put into service. The average mileage per day is about 35 miles. The consumption of gasoline is surprising in comparison with other trucks we have working alongside of us every day. We average 5½ miles on a gallon of gasoline with our 3½-ton truck, which carries 1½ tons overload daily.

Our two-ton Armleder trucks are not loaded above their capacity and give us 9½ miles per gallon. You understand, these motors are started at 6:30 in the morning and run constantly all day with the exception of the driver's lunch hour. The reason for this is that they are equipped with a special hydraulic hoist, which is in operation when the truck is standing still.

The 3½-ton truck takes the place of three teams. We have experienced a hard winter, with more snow than we have had for some years, but these trucks did not miss one load in all the bad weather.

We are so well pleased with Armleder trucks that we are disposing of 35 head of horses and in the near future our coal will be handled by trucks exclusively.

The main reason for this is that the cost on an average is about 52 cents per ton delivered by horses, and our trucks have not exceeded 32 cents. We are pleased to state again that we are very well satisfied with our Armleder trucks and do not honestly think there is any other make on the market today that can compete with it.

Very truly yours,

The Schwalb Coal Company,
92 Portland Avenue,
Henry J. Schwalb, Sec'y.

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ACME
THE TRUCK OF PROVED UNITS

Now Is the Time to Build Your Truck Business — Get the Acme Plan!

It is a mathematical certainty that the business of selling trucks is in for the greatest boom the industry has ever known. Increased commercial wealth—trebled demands on manufacturers—a general speeding up of business to meet the new conditions; these, plus the fact that railroads must give preference to government hauling, thus opening an added field for truck transportation, point to tremendous truck demand.

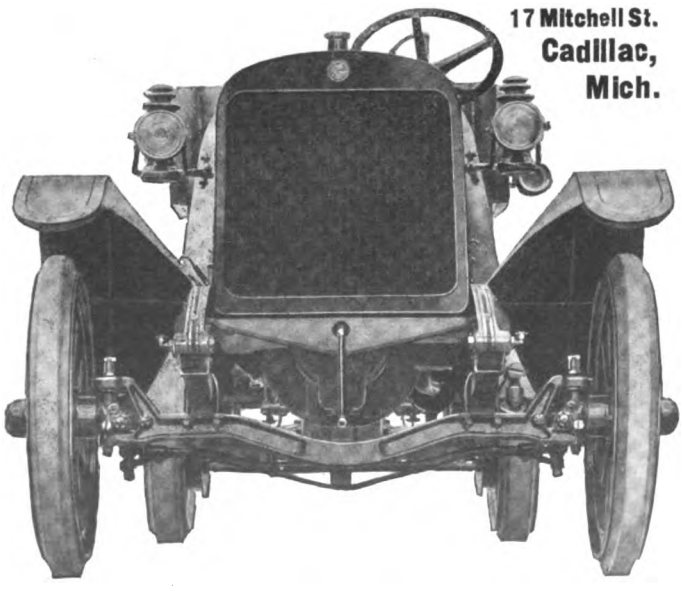
Now the Acme sales plan which enables the dealer to cut selling costs, holds even greater value than ever before. And the Acme truck—with its dependable, proved units, such as Continental Motor, Timken Bearings, Timken Axles and Worm-Drive, Detroit Springs, Cotta Transmission, etc., offers a new, true standard of money's worth in service.

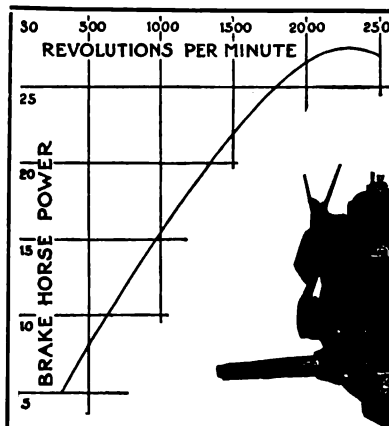
Write for Free Book

Your prospects know the powerful Acme and its record for performance. Do YOU know the Acme plan? Write at once for complete details, and our valuable free truck book—"A Pointer to Profits."

Cadillac Auto Truck Co.

17 Mitchell St.
Cadillac,
Mich.

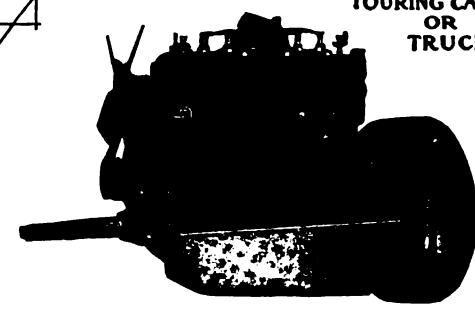




LE ROI MOTOR

3⅛×4½ MODEL C

FOR THE LIGHT ROADSTER TOURING CAR OR TRUCK



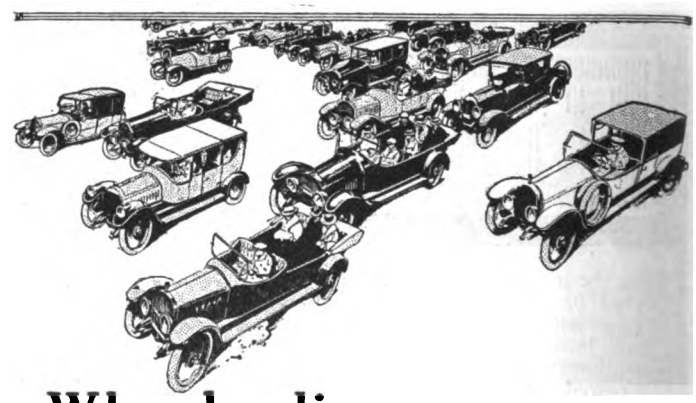
Used by leading manufacturers of best-known American-made light trucks.

The business of manufacturing Le Roi Engines, formerly conducted by Milwaukee Machine Tool Co., is now carried on by

LE ROI COMPANY

Mitchell St. and 60th Ave.
MILWAUKEE, WIS.

Write for Complete Information



Why leading cars use Thermoid Brake Lining

Realizing the importance of good brake lining, leading car and axle manufacturers select for their cars and axles the brake lining that won't grab or slip—Thermoid Brake Lining.

Some of the cars that use Thermoid Brake Lining are:
Pierce-Arrow, Peerless, Marmon, Haynes, Studebaker, Kissel, Apperson, Premier, Chalmers, White, Auburn, Service Truck, Metz, Autocar, Briscoe, Pathfinder, Hudson, Cadillac, Cole, Lexington-Howard, Rauch & Lang, Atlas Truck, King, Stephens, Patterson, Superior Truck, Davis, Kline Kar, National, Bessemer Truck, Sayers & Scovill, Pilot, Sun, Empire, Moon, Ames, Gersix Truck, Republic Truck, Fulton Truck, Columbia Truck, Denby Truck, Bethlehem Truck, Union Truck, Hudford Unit, Denmo Truck, Lippard-Stewart Truck, Moreland Truck.

Specify Thermoid

When you reline your brakes, specify the brake lining the experts specify—Thermoid. Jobbers, garages and dealers will be glad to supply you.

THERMOID RUBBER COMPANY
Factory and Main Offices: Trenton, N. J.
Branches: New York Chicago San Francisco Indianapolis Detroit Los Angeles Philadelphia Pittsburgh Boston London Paris

Thermoid HYDRAULIC COMPRESSED 100% BRAKE LINING

Makers of "Thermoid Tires" and "Thermoid Garden Hose"

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Repeat Orders

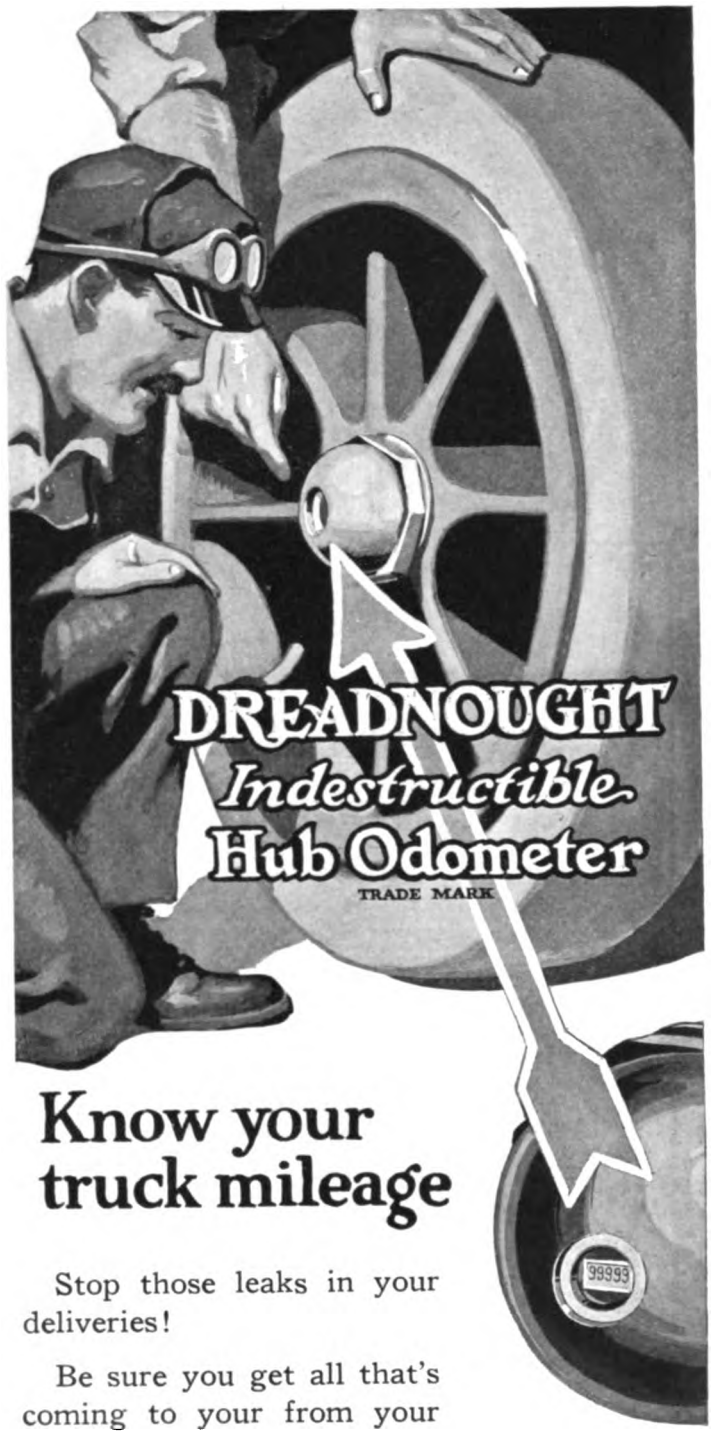
Every month orders come to us from old customers who have proven for themselves the superiority of

Mack TRUCKS

Our sales records during the past few years show hundreds of repeat orders from MACK users.

For sixteen years MACK Trucks have set new standards of efficiency and dependability.

International Motor Company
64th Street and West End Avenue
New York City



Know your truck mileage

Stop those leaks in your deliveries!

Be sure you get all that's coming to your from your **driver's time and from your tires, gasoline and oil.**

Know which trucks are profitable and which are not.

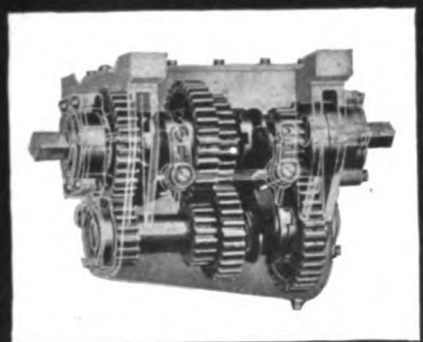
Guaranteed indestructible: The Dreadnaught is protected by a heavy cast housing—the only hub odometer guaranteed collision proof. A new one free if you break it, no matter how. Figures always show right side up. Always working. Grease-proof, dust-proof. Cannot be tampered with. Accurate.

Send for booklet and prices—*Now*

AMERICAN TAXIMETER COMPANY
Mfrs of Jones & Popp Taximeters
1765 BROADWAY, NEW YORK CITY

Service Stations: New York San Francisco New Orleans Washington Chicago Detroit Boston Philadelphia Seattle St Louis Cleveland Buffalo Los Angeles

COTTA TRANSMISSIONS

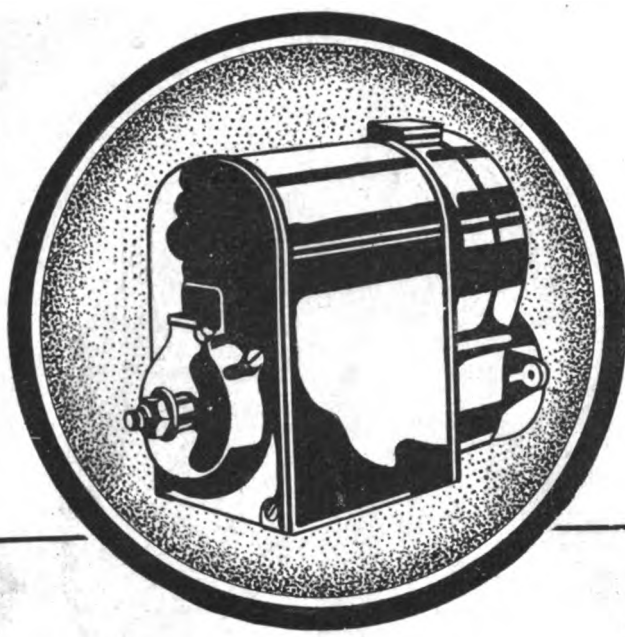


All Gears Always in Mesh

An Assurance of Dependable Service

The Cotta Transmission Co.
Rockford, Ill.

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"Just Why is the Eisemann Better?"

Eisemann Magnetos have fewer parts than the others; the one-piece frame alone saves many parts; that means strength.

They pick up and distribute the current by a more direct route; that prevents electrical losses.

Their vital parts are most carefully protected from dust, water and oil; that adds reliability.

The well-proportioned winding and the patented pole pieces account for the hot, powerful Eisemann spark and the consequent snappy explosion.

Truck use is the severest test of a Magneto. Seventy-five truck makers know the facts about the Eisemann and have adopted it. That means something!

THE EISEMANN MAGNETO CO.
Sales and General Offices:
32-33rd St., Brooklyn, N. Y.
Chicago, Ill., 910 So. Michigan Avenue
Detroit, Mich., 802 Woodward Avenue

THE EISEMANN MAGNETO

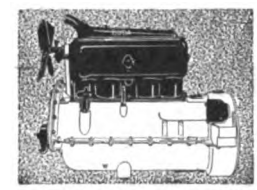
The GLOBE Truck
The Motor Truck PLUS



Brings to dealers extra value, plus a selling force and service that is unusually intensive—unusually complete. Four models: 1-ton capacity, $1375; 1½-ton, $1690; 2-ton, $1985; 3½-ton, $3185. **Write for complete details.**

Globe Motor Truck Co.
East St. Louis, Illinois

"LET US HAVE THE FACTS"—No. 6



VAPORIZATION

Many have the impression that vaporization is identical with carburetion and is, therefore, a function of the carburetor.

In reality a great deal of vaporization takes place after carburetion. Motor economy is largely dependent upon this latter part of the process.

The BUDA MOTOR

is very economical, due in part to the high degree of vaporization made possible by its design and methods of manufacture. The intake manifold is surrounded with a hot water jacket and also warmed by the exhaust.

The pistons are beautifully fitted into ground cylinders—and made to stay that way; a further assurance of permanently good vaporization.

These may seem but commonplace details, yet it is the development of all details which makes the Buda Motor.

You can get a very good idea of how we build the Buda Motor from the very complete description and specifications in the *New Truck Motor Catalog.*

Write us for it.

THE BUDA COMPANY, HARVEY (Chicago Suburb) ILL.

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The "Baby Wood"



Hydraulic Hoist—
TYPE "E"

just as good a servant for the small dump truck,

as Father Type "D" Heavy Duty is for the Big Dump Truck, and Mother Type "C" was for the middle-size Dump Truck.

* * * *

—the lightest,
—the simplest,
—the most positive,
—the quickest-working and most easily installed Dumping Device made.

Made to fit any chassis.

Sole Manufacturers

Wood Hydraulic Hoist & Body Co.
New York DETROIT Chicago



CONTENTED DRIVERS, with light hearts and untired muscles, are one reason why *Ross Steering Gears Predominate on Motor Trucks.* One hundred and fifteen manufacturers—over half the industry—use Ross Gears as standard equipment.

Write for Catalog and any special information desired.

ROSS GEAR & TOOL COMPANY
750 Heath Street Lafayette, Indiana



A Truck and Name that Means Much in Traffic and Transportation

INTERNATIONALS are bearing a surprisingly large part of the nation's burdens in this trying period when it is the duty of every factor in American commerce to render the best service without waste or delay.

Internationals are in dependable action in every line of industry, in every corner of the country. They are conveying food supplies for Armour & Company; delivering goods for the largest department stores; extending the trade of the nation in the service of the American Express, the Northern Express, and Wells Fargo; uniting the trade of the nation in the service of Standard Oil and Gulf Refining, Western Electric and American Telephone & Telegraph, and Bell Telephone.

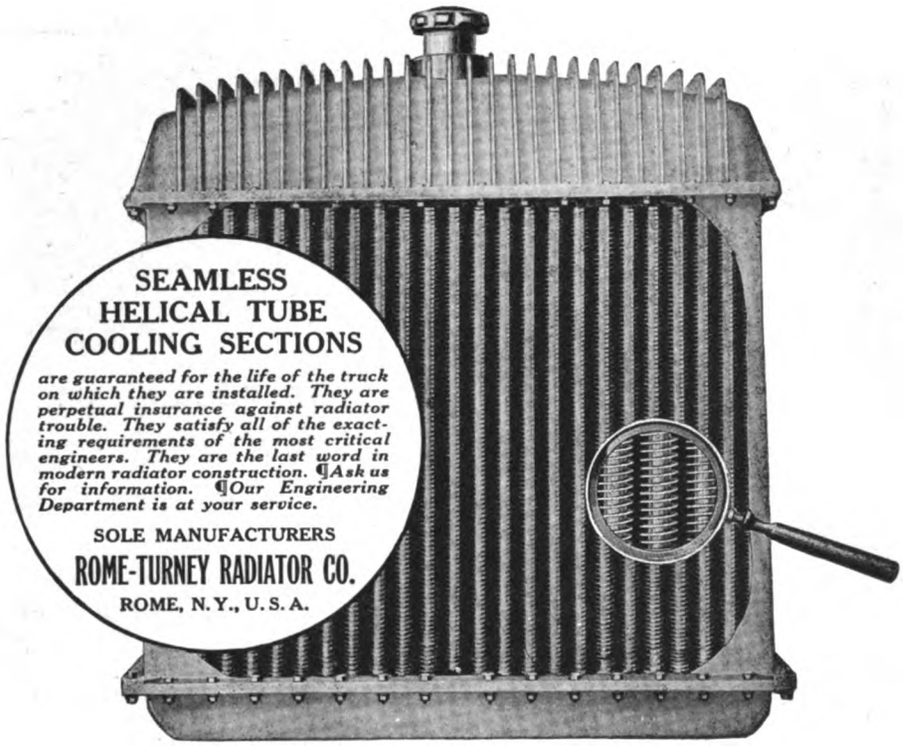
International Motor Trucks are proving themselves a crowning product of a 75-year-old manufacturing and service organization that has never been interested in any but the very highest ideals in machine building.

Eighty-nine International branches in principal cities are rendering attention of the kind that motor truck owners want and appreciate. Here are on display the late models, of 1500 and 2000-lb. capacities, attractive trucks at moderate prices, with long life built into them from the frame and engine to final detail. Write the address below for catalogues and any other information regarding **International Motor Trucks.**

International Harvester Company of America (Incorporated)

88 Harvester Building **Chicago U S A**

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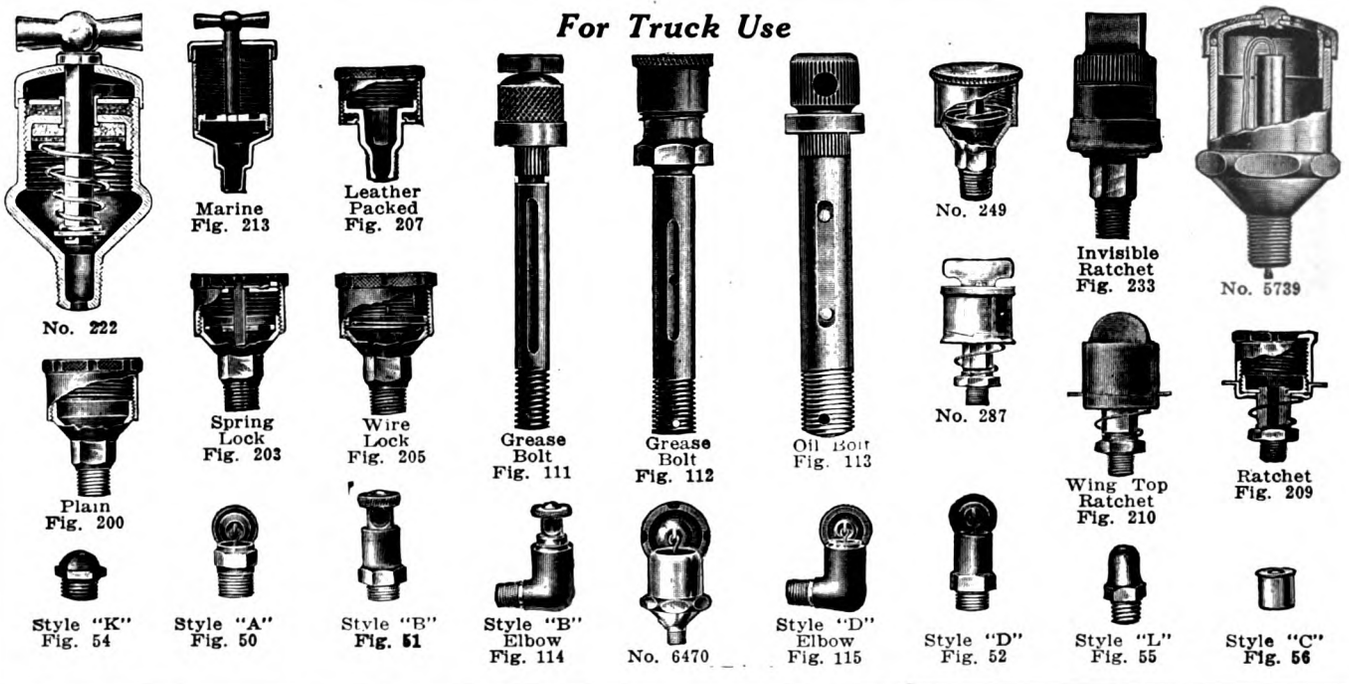
SEAMLESS
HELICAL TUBE
COOLING SECTIONS

are guaranteed for the life of the truck on which they are installed. They are perpetual insurance against radiator trouble. They satisfy all of the exacting requirements of the most critical engineers. They are the last word in modern radiator construction. ¶Ask us for information. ¶Our Engineering Department is at your service.

SOLE MANUFACTURERS
ROME-TURNEY RADIATOR CO.
ROME, N.Y., U.S.A.

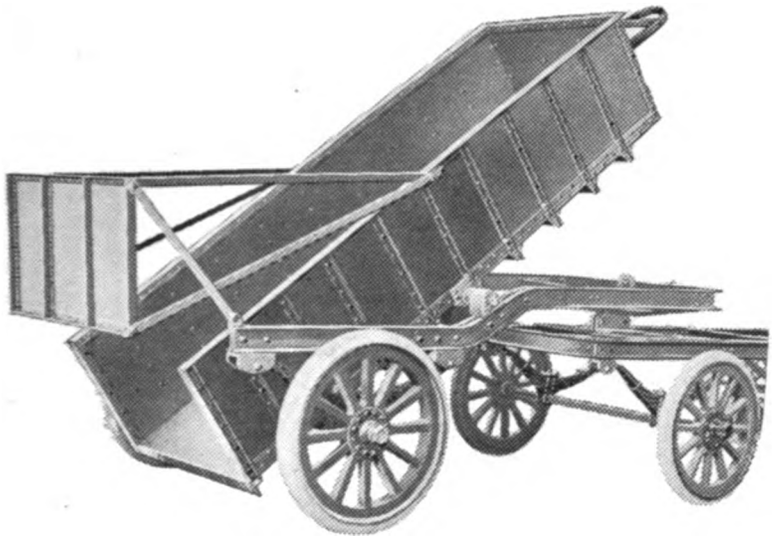
EMPRESS
OIL AND GREASE CUPS

For Truck Use



BOWEN MFG. CO.
AUBURN, NEW YORK
SEND FOR CATALOGUE "A"

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MR. DEALER

You Can Make Big Money If You Sell

Rogers Brothers All-Steel TRAILERS

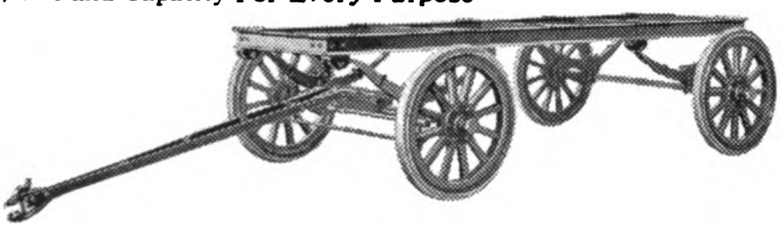
THE MOST EXTENSIVE AND BEST LINE OF TRAILERS MADE TODAY

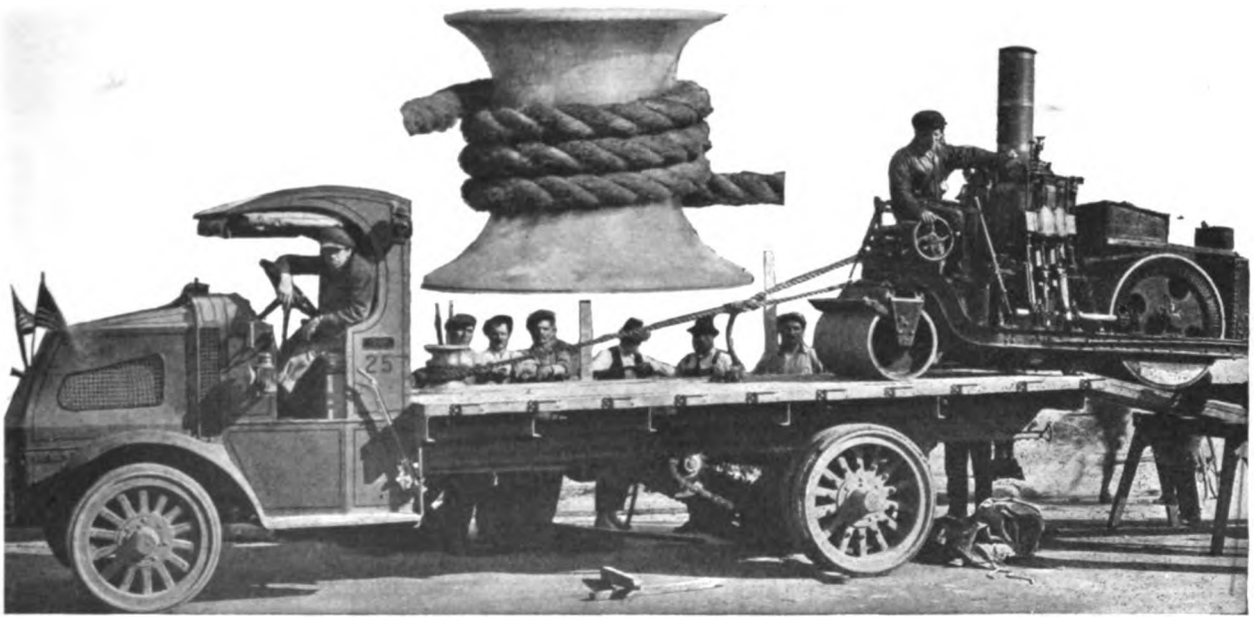
TWENTY-SEVEN MODELS

Made in Every Type, Size and Capacity ***For Every Purpose***

Rogers Brothers Company
Albion, Pa.

ROGERS BROTHERS COMPANY
Of NEW YORK
Eastern Distributors and Exporters
50 EAST 42d STREET NEW YORK





A TRUCK WINCH THAT'S SAFE

It's the Mead-Morrison, a special patented device that is being used with great success by general truck firms, electric light and power companies, furniture movers, grain dealers, contractors and other concerns who make it a business to hoist heavy units, in addition to hauling them.

The installation of the Mead-Morrison Patent Truck Winch is extremely simple. It not only cuts hauling and hoisting costs to a minimum but it also is used for hauling the truck itself out of mud holes and ditches. And above all, it is a safe winch.

Capacity, single line 3500 lbs. at rope speed of 60 feet per minute. Space required, 22 inches square. Fitted with automatic brake, making it SAFE AT ALL TIMES. Write for particulars.

MEAD-MORRISON MFG. CO. EAST BOSTON, MASSACHUSETTS

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Ball Bearings
for Efficiency
Others for Price



U.S. Ball Bearing Mfg. Co.

Conrad Patent Licensee

CHICAGO ILLINOIS

U S BALL BEARINGS

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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Dealers

You can place your business on a permanent, profit-paying basis.

You can put new life, confidence, real selling ability and lots of snap and punch where you get results in real money.

Ours is not a new proposition—it is an even, steady, ambitious and successful business backed by:

High financial standing
Long manufacturing experience
Large factory organization
A complete line of trucks
Ability to make prompt deliveries
Last but not least—a substantial, living discount.

Send for our dealer proposition

J. C. WILSON COMPANY
486 Warren Avenue Detroit, Mich.

WILSON TRUCKS

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100% Service

DAY-ELDER MOTORS CORP
DAY-ELDER
WORM-DRIVE
NEWARK-N.J.-U.S.A.

2½ Ton Chassis With Elevating Dump Body With Power Hoist

¾ Ton, $950 1 Ton, $1495 1½ Ton, $1755 2½ Ton, $2365

Whether as a dealer or a buyer—the first big impression that Day-Elder Worm Drive Trucks make upon you is the remarkable VALUE they represent at their prices.

The two elements by which the VALUE of any motor truck is determined are the materials and units which are used in its manufacture and the SERVICE which the finished product will give its purchaser.

We have no monopoly on the high grade units used in Day-Elder and other high class motor trucks—but we give you these splendid units, together with Day-Elder Quality of Manufacture and Day-Elder SERVICE at prices that constitute the next thing to a "corner" in VALUE-GIVING.

If you are in the business of selling motor trucks and are interested in controlling a line that is "live" and sells with a minimum of effort—D-E Worm Drive Trucks will appeal to you tremendously.

In D-E Worm Drive Motor Trucks you have practically every "talking point" of which all other good motor trucks can boast—PLUS that strongest of all arguments: GREATER VALUE AND SERVICE.

They have always sold faster than we could produce them—but with greatly improved manufacturing facilities our output has been materially increased. We are now in a position to talk "turkey" to a few good dealers who are on the way up. Write or wire for specifications and dealer proposition.

DAY-ELDER MOTORS CORPORATION

GENERAL SALES OFFICES: 1459 BROADWAY, NEW YORK
P. K. HEXTER, Sales Manager
FACTORY: 165 OGDEN ST., NEWARK, NEW JERSEY, U. S. A.

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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Great Battleship Turrets revolve swiftly and silently on Standard Bearings

SRB

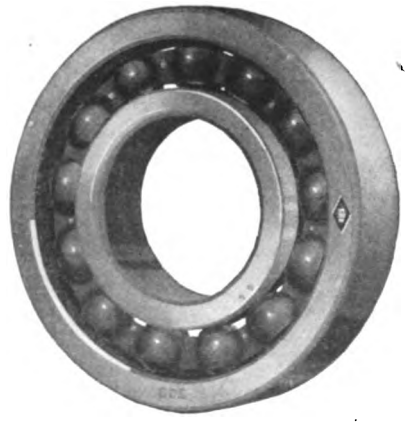
Sturdy Reliable Bearings

MAXIMUM SILENT ANNULAR BALL BEARINGS

The movement of battleship gun turrets is only one of the many exacting purposes for which S R B Bearings are used.

S R B Bearings are designed to meet every requirement, large or small. Let our Engineering Department help you select the type that will give you the greatest efficiency.

Dealers in cities where we have no representative will find our agency proposition very interesting.

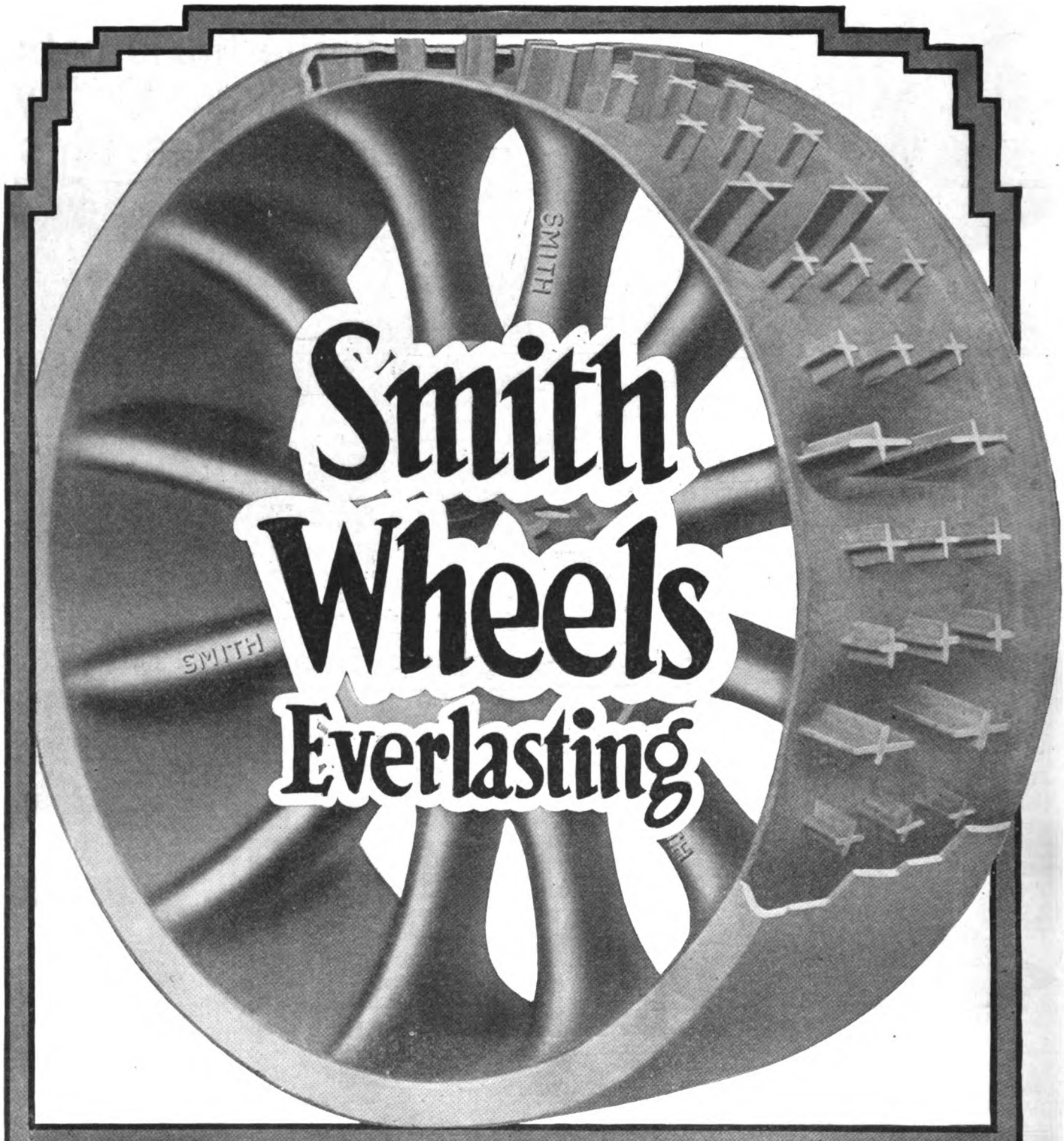


Makers of S R B Annular Ball Bearings, Ball Thrust Bearings, Taper Roller Bearings, Steel Balls and *Rudge-Whitworth* Wire Wheels.

Standard Roller Bearing Co.

PHILADELPHIA, PA., U. S. A.

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SMITH WHEELS SAVE YOU MONEY!

$200 to $500 a Year on Each Truck of 1½ Tons Capacity and Upwards

Tire Mileage Increased! Gasoline Mileage Increased! Truck Life Increased!

Smith Wheels Guaranteed DURING LIFE OF TRUCK on which originally placed

INSIST ON "SMITH WHEELS" ON THE NEXT TRUCK YOU BUY!

SMITH WHEEL INC., SYRACUSE, N. Y., U. S. A.

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Traffic FEDERAL News

JULY 15, 1917

[illegible] Desert Stretch
[illegible] Lincoln Highway

This Number Contains:

Truck as a Horse Ambulance
A Truck Accident
Motor Milk Farm
Original Detroit Cars "Another"
Duke Lecture & Sam's Record
Ogden, Utah, Motorcycle
Denver's "Brass Cab" Truck



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Trucking Over the Desert Stretch of Lincoln Highway

FEDERAL Truck Makes Regular Trips Between Fallon, Fairview and Wonder, Nevada—Over Roads that Pleasure Cars Seldom Negotiate

THE front cover of this issue of TRAFFIC NEWS gives a good idea of one section of the Lincoln Highway where traveling is no sinecure. This is the sage brush country of Nevada, and this and the other pictures shown were taken in the vicinity of Fallon, Nevada, in the country famous for its Sink Hole, Flats and Sand Springs. To you who have traveled on the macadamized sections of the Lincoln Highway and not over the Western Desert section, this picture will perhaps be a revelation. To those living where smooth pavements and hard roads are prevalent, the idea of hauling heavy loads for several hundred miles over roads of this kind every day in the year will be a new idea. Although the FEDERAL shown in the picture is one of the older models, yet it has run on this stage line for three years and eleven months and is doing good work every day with heavy loads and hard going. The scenes shown are on "the flats" and in the background of some of the pictures may be seen the foothills of the Sierra Nevada Mountains.

The Lincoln Highway between Fallon, Fairview and Wonder, over which this FEDERAL Truck operates, has some very poor spots with very bad hauling conditions. For instance, on the 4 mile flat, 26 miles east of Fallon (the picture on the front cover of this issue) the ruts are often so deep that it is almost impossible to turn out if you meet a car, and the centers are so high that the axles drag in the dirt. When it rains it is impossible to get across this flat without chains. No pleasure car driver will attempt it in the rainy season if he is in his right mind.

Mr. J. B. Wainwright, FEDERAL dealer at Reno, Nevada, says that they call the FEDERAL shown in the picture accompanying this story, the "Old reliable" because it has never yet failed to come home on its own power, and when you consider the road conditions where it has to operate, this is indeed remarkable.

Mr. Wainwright says that this strip of road is a disgrace to the Lincoln Highway, and also to the State of Nevada, and no doubt measures will be taken soon to improve this for cross-country and local traveling. Some idea of the terrible condition of the roads may be gained from the picture of the touring car which is being not only jacked, but levered up with planks and timbers out of the soft, sticky chock hole, near the famous Salt Wells of Nevada. This picture was taken on what is known as the 8 mile flat, about 17 miles east of Fallon, Nevada. When pleasure cars cannot get through this piece of road the FEDERAL Truck plows along with its 3500 or 4000 lb. load and always comes in on its own power.

Truck drivers who complain about conditions of roads in the Central West should be permitted to drive over this road once in a while, and then they would never complain of the conditions of the roads in their country.



This is what Happens at Times to Pleasure Cars on the Eight Mile Flat—Near the Salt Springs



FEDERAL on "Four Mile Flat"—Lincoln Highway—26 Miles East of Fallon, Nevada—With Ruts so Deep Turning Out is Next to Impossible.



Here is a Truck With a Big Record in Monroe, La.

THE above picture shows a 1½-ton FEDERAL owned by the Sugar Bros. Company of Monroe, La.

The remarkable thing about this truck is that it has never had a dollar's worth of expense or repairs and has given excellent satisfaction, although running in the South where temperatures are very hot in summer.

The truck is operated by a negro, who previous to his being given this job had never had any experience with an automobile or any mechanical contrivance.

Very heavy loads have been hauled on the truck, and there has never been an accident, or mishap or delay. The truck, as shown in the picture, is loaded with a shipment of a famous brand of Toasted Corn Flakes for distribution in Monroe. On this particular trip the truck made 21 stores, delivered its load, going a distance of six miles in one hour and 15 minutes, including stops. Under these conditions this kind of haulage is indeed remarkable.

Attention FEDERAL Drivers!

WE WOULD like to exchange a Federal Pencil Clip for a driver's record. Any driver of a FEDERAL can obtain one of these beautiful, practical pencil clips by furnishing us records on the cost of operation of his FEDERAL which can be used as an article in TRAFFIC NEWS.

Intimate stories of the good work done by FEDERALS are oftentimes overlooked by the owner, but the driver employed in his work can give us information which will be interesting to others interested in motor haulage.

Address: Traffic Engineering Department, FEDERAL Motor Truck Co., Detroit, Mich., and enclose FEDERAL Truck record.

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This 3½ Ton FEDERAL is Busy All the Time on the 4th City's Fire Alarm Work

City of Detroit Uses FEDERALS for Special Work

Fire and Police Departments Have Trucks Equipped With Winches for Wire Work for Signals

MUNICIPALITIES all over the country are using FEDERALS in public service. We have already had the story of the FEDERAL in the service of the Detroit Water Commission in the April 15th issue of TRAFFIC NEWS on the drivers' page.



Showing "4000 Pound Pull" Winch Equipment on these Public Service FEDERALS

Herewith we show two views of the FEDERAL in the service of the Detroit Fire Department in the Telegraph Corps Division. On this truck depends the keeping up of the Alarm System of the city of Detroit, without which the fire department would be helpless.

Detroit's growth to 850,000 people, almost half of which has come in the last ten years, necessitates a great deal of new wire systems by the various departments of public service, and yet this FEDERAL performs the work for this division of the service in a perfectly satisfactory manner.

A very interesting feature of this truck is the winch which is mounted just at the back of the seat, which is shown in detail in one of the cuts. This is a type "A", O. K. winch, mounted on a 3½-ton chassis, connected with the secondary shaft of the transmission by means of a special clutch, together with sprockets and chain. The winch is used to pull heavy lead-covered, underground cables, through manholes. The throw-out lever is connected with the small clutch on the chassis and is located just at the back of the seat within convenient reach of the truck driver. The cable drum is 9" in diameter carried on a 2¼" shaft. It has a capacity of 1000 ft. of 1½" steel cable, and is geared to a speed of 75 cable feet per minute. This winch has a pulling capacity of 4000 lbs. on a straight pull. The weight of the winch is about 950 lbs.

The efficiency of this equipment and this FEDERAL has been attested by the Fire Department officials in charge of the work.

The Detroit Police Department Signal Bureau has just purchased a new model FEDERAL 3½-ton, also equipped with a winch similar to the fire department job. The picture of this new FEDERAL is shown just as it was put into service. This equipment was purchased as a result of the satisfaction given by FEDERALS in the other departments of the Detroit Public Service.



One of the Model W, 3½ Ton FEDERALS just put into Service of the Detroit Police Department Signal Bureau

A Motor Milk Train

THE people of Detroit must have cream for their coffee, and the babies of this city must have their bread and milk, so W. Simcock of New Boston, Mich., makes daily trips seven days in the week with a total of 80 cans of milk on a FEDERAL and Trailer, averaging about 70 miles per day. The actual road distance from New Boston is about 50 miles, but Mr. Simcock must go out of his way to procure milk which he hauls daily for the Detroit Creamery Co. There must be no delay; there must be no failures; the trip must be made, that's all. It takes about four hours to complete the round trip and after that Mr. Simcock has time for other things.

Although this is one of the older models, Mr. Simcock has been its owner since last August, and he has operated it for nearly a year with practically no repair expense, the



FEDERAL Hauling Milk to Detroit Creamery

only items being one set of chains and a broken front spring. One bad feature of the trip is the five miles between Wallace, Mich., and New Boston, where he encounters some very unfavorable road conditions, but in spite of this the FEDERAL does good work and is faithful to its job.

Mr. Simcock is very well pleased with its performance.

Increase In Price

Because of the increase in cost of materials and labor, it has been necessary to advance the price of all FEDERAL models.

No promise can be made of the length of time that these prices will be in effect—unusual conditions may make necessary a further advance.

NEW LIST PRICES ON ALL MODELS

FEDERAL Motor Trucks

Chassis Prices In Effect June 20, 1917

1-Ton, . $1750 2-Ton, . $2450
1½-Ton, $2200 3½-Ton, $3150
5-Ton, $4200

Light Duty Tractor, $2300 Heavy Duty Tractor, $3275

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Ogden, Utah, is Becoming FEDERAL-ized

Parade of Fifteen FEDERALS Shows Citizens of Western City the Completeness of Its Motor Equipment

TO illustrate the advent of a number of fleets and special trucks purchased by Ogden business men, the Cadillac Company, of Ogden, Utah, recently gave a demonstration in the form of a parade.

Odgen is a city of 25,000 population, and when this is taken into consideration it will bring greater realization of the change from horse haulage to motors, which has taken place in this progressive western city.



This Big Bus With Band Led the Parade

One of the FEDERALS shown, which took part in the parade, is hauling two trailers.



One of the Units of the Demonstration

This is in the service of the Utah Construction Company, one of the companies which is building many of the large buildings and the public projects in the West. Other companies which have become FEDERALIZED recently in this city, are:



Groceries in Ogden are Delivered by FEDERALS



Ogden Coal and Lumber are FEDERAL-ized

Odgen Paint, Oil & Glass Company
Murphy Grocery & Drug Company
Utah Packing Corporation
Odgen Bus Line
Amalgamated Sugar Company



Utah Construction FEDERAL With Trailers

Utah Canning Company
G. Williams Coal & Lumber Company
John Farr Coal Company
Shupe-Williams Candy Company
Corienne Concrete Tar Company
and others.

The parade, as it traversed the streets of Ogden, was lead by a brass band followed by about 15 FEDERAL Trucks. On each truck was a banner, lettered—"Another FEDERAL" delivered to various companies.



The Utah Packing Corporation Gets "Another"

This parade caused no little comment, and advertised the fact that this city has turned to motor trucks as a solution of its haulage problems.

"Good Roads or Bust"

Texas Highway Improvement Slogan Helps Speed Up Work

THAT West Texas is a strong "Good Roads Booster" was never better illustrated than by the Good Roads Convention held at Midland, Tuesday, September 26, 1916. Over 400 delegates from 20 counties met for the purpose of securing a National Highway along the Texas & Pacific Railway, the same to be a link in the Old Spanish Trail or Southern Ocean to Ocean Highway.

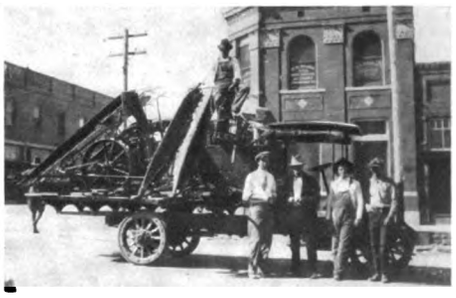
These West Texas enthusiasts have been working on their own resources as the state cannot secure Federal aid until a state highway commission is appointed.

The prominently displayed slogan, "Good Roads or Bust," indicates their determination. From Howard County alone 52 automobiles made the trip to Midland; and Big Springs, of this county, had the largest number of delegates present.

Among those deeply interested in this "Good Roads or Bust" movement is the Big Springs Transfer Company, of which Mr. S. B. Stone is manager.

This Company has been working in Dawson, Borden, Mitchell, Glasscock, Martin and Midland Counties and they state that they will send their FEDERALS still farther when the roads are in condition.

The attached photograph shows their 1½-ton FEDERAL conveying two binders to Howard County farmers. It was necessary to carry these binders 20 miles and the roads were none too good.



The Big Springs Transfer FEDERAL Helps Make Roads Better in Texas

The Big Springs Transfer Company is just as enthusiastic over the work of their FEDERAL as they are over the Good Roads propaganda.

Mr. L. B. Stone, driver of this truck wrote recently of their satisfaction.

"We are more than pleased with our truck as we have found so many things to do, which would be impossible with horses, that it seems wonderful indeed.

"As to gas consumption, we are getting, on an average, about five or six miles, and when you get that mileage in this country you can say you are doing well.

"Since we purchased the truck I have been hauling in about six counties and expect to go in six or eight more this fall.

"I was in El Paso a few days ago and was surprised to see so many FEDERALS there, and they seemed to thrive well under the heavy work they were doing."

New Prices for FEDERALS

ON THE preceding page are the new prices for FEDERAL chassis in effect since June 20.

If you are contemplating purchasing a truck, your order should be placed immediately for further advances may be necessary at any time because of rising material prices.

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Some New FEDERAL Photographs



Two of a Fleet of Many One-Ton FEDERALS Going to Armour & Co.



Herbst Importing Co., Milwaukee, Gets "Another"



A Corinth, N.Y., Paper Case Co. Gets a 2-Ton



An Albany, N.Y., Baker Will Use This One-Ton



This Light Tractor Will Operate in Philadelphia



This Big 3½-Ton Has a Special Body for Bulky Loads Operated by the Chicago Flexible Shaft Co.

Sick Horses Safely Transported in this FEDERAL

IN Los Angeles a sick horse gets a lot of attention. There, the Humane Animal Commission of the City of Los Angeles, has built a special body on a FEDERAL Truck which has been in use for several years. So unique is the construction of this body that it has been shown in pictures in various mechanical publications, and we are indebted to Municipal Engineering for the cut of some pictures showing the operation.

This body, mounted on a 1½-ton FEDERAL, is so arranged that the harness is stripped from the sides and the horse may be suspended so that his weight is entirely removed from the floor. The door in the back is made with a very easy incline so that a badly crippled horse may be lead up. In some cases, as it is impossible for a horse to back down this incline after being injured, a door has been placed in front on the left (shown in the picture with the ladies of the Humane Society grouped around it), so that the horse can be lead out in that direction. The sides of the body are heavily padded, and there are curtains to be dropped in inclement weather. There is a moving platform in the bottom of the ambulance, attached to a winch running from the motor, so that it will drag a horse, no matter how heavy, into the car; and should a horse be lying prone, the platform is moved up nearer and he is simply turned over on to it and dragged into the ambulance by the power of the motor.









The Demand for FEDERALS increases—and the number of present production, 1 to 5-Ton capacities, in operation all over the country grows as rapidly as the concentrated facilities of the factory can produce them.

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Traffic FEDERAL News

Published in the interest of
ECONOMICAL TRANSPORTATION
by the
FEDERAL
MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

Edited by: L. B. DUDLEY : Advertising Manager

EDITORIAL

Your Driver is the Brains of Your Truck

HE is human—not just a part of the machinery. The power which comes at the touch of his hand or foot is working for you—making dollars come from accomplishment—if wisely directed.

Therefore to make friends with him—to tell him of your plans for the haulage department of which he is an important part, is only just—and it will pay dividends.

Perhaps he has never stopped to think that a running motor with truck idle costs money and increases cost of operation. He must become interested in keeping unnecessary expenses down.

Various methods have been adopted by firms to make it worth while for drivers to minimize waste time and keep truck in its best running condition.

Of all such systems, however, the driver's bonus plan seems to have produced the best result.

How the Bonus Plan Works

One of the largest manufacturers of automobile parts in the country has tested this idea and has proved to its entire satifsaction that it is a good investment.

The manner in which the bonus is awarded is quite simple. After cost records have been kept for some time a standard cost per ton mile, (hauling one ton one mile) was determined from the averages thus obtained.

Also a maximum cost is determined from the same figures and the driver is offered 50% of the saving between the maximum and the standard.

Example:

(a) Standard cost per ton mile = $0.05.
(b) Maximum cost per ton mile = $0.075
(c) Operator's Actual Cost per ton mile = $0.06
(d) Total ton miles accomplished = 1800

The driver's bonus is determined by the formula:

$$\frac{b-c}{2} \times d = \text{bonus},$$

which in this case would be:

$$\frac{.075-.06}{2} \times 1800 = \$13.50$$

It All Depends on the Operator

In other words—by careful driving after understanding where and how he can reduce expense and increase efficiency the driver would earn $13.50 per month in addition to his wages. This company has found that high reward will bring high accomplishment. The driver has found that it pays him to serve well.



After a Dip in the Creek FEDERAL Runs Alright

MANY publications do not publish pictures of accidents. This is probably because they do not wish to feature the occasional danger of motoring. However, sometimes it is impossible to avoid an accident.

Pictured here is a 3½-ton FEDERAL, owned by the Minor Transfer Company, New Kensington, Pa., which went over the abutment of a bridge, landing with its fore wheels in the creek below, the hind wheels remaining on the abutment.

Our reason for showing this picture is to illustrate the stamina and rigid construction of the FEDERAL Truck, which made it possible in this instance for the truck to be raised up from the hard stones of the creek bed and to return home on its own power.

This accident occurred at North Bessemer, Pa., on the night of May 23rd last, Mr. Minor himself driving the truck at the time. While descending the steep grade and reverse curve of the bridge at a good rate of speed, the glaring head-lights of a pleasure car coming towards him across the bridge made it impossible for him to see the road, and so the truck ran over the abutment, but very luckily both Mr. Minor and the truck escaped serious injury.

Early the next morning the men from the Lawrence Motor Company, FEDERAL Dealers in Pittsburgh, were on the job with their wrecking paraphernalia, and they soon had an inclined platform built under the truck, down which, with the assistance of a block and tackle made fast to the oil derrick shown in the picture, the truck was lowered and run onto the little island shown on the right. An examination of the truck at that time showed that it was practically undamaged; its engine was started and with the assistance of a service truck it was backed up the incline practically on its own power onto the roadway. This truck ran all the way back to Pittsburgh to the Service Station on its own power. Barring a small chip out of the radiator shell, a bent running board, bent brake-rod and reversed rear spring shackles, the truck was absolutely undamaged, in spite of the terrific impact sustained when it plunged onto the rocks shown in the picture. That it was moving at a high speed when it went over is shown by the fact that it had sufficient "jump" in leaving the abutment for the engine and clutch housing to entirely clear the edge of the stone-work and thus escape injury.

This was a very lucky accident, and yet any piece of mechanical construction must be carefully designed and constructed of the best materials to withstand a shock such as this must have been. This is only one more instance of proof of FEDERAL value.

Eight Months' Trial Shows Efficiency

Eight months of this method in the business of delivering automobile parts using four different makes of trucks has resulted in increased loads, (without overloading) high percentage of operating time and decreased cost.

The eight months' results were as follows:

Trucks Number	Ton Miles per Mo. Per Cent Gain	Cost per Ton Mile Per Cent Decrease
1	45.4%	37.7%
2	5.5%	13.8%
3	3.5%	29.8%
4	1.5%	11.5%

No explanation is given by the concern as to the great variation in percentage of gain in efficiency of the different trucks. If you care to write them regarding this, we will not only furnish their address, but also give you the name of the truck and driver making greatest increase in ton miles and greatest decrease in cost per ton mile.

Plan Discourages Motor Truck Abuse

Generally, this plan if adopted will discourage abuses of all kinds and encourage careful driving.

To aid the driver in this accomplishment—record keeping should be accurate and the instruments recommended previously in TRAFFIC NEWS should be used.

Take your driver into confidence—he will make your investment pay—he will work the truck to its full capacity—he is the brains of your motorized equipment.

Help him to think.

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FEDERAL Drivers' Page

"In honestly striving for a creditable performance you dignify your work and your daily accomplishments become a permanent record that can be pointed to with pride"



G. W. Calkins

Paper Box Company Uses FEDERALS at its Four Factories

G. W. Calkins and F. A. Best, Drivers for John Leggett & Son, Help Their Company to Keep Cost of Operation Down—Records Show Good Work

PAPER is playing an important part in the business world. In its various forms paper has been substituted for many materials used in the manufacture of articles of commerce. It is a well known fact that paper pulp, under proper conditions and compression, is used in manufacturing cardboard, imitation woods, and even iron.

John Leggett & Son, Inc., Troy, New York, manufacture paper boxes and at their factories in Troy, Hudson, Glen Falls and Cohoes, thousands of those highly useful articles are turned out every week.

It is necessary, in order to produce these boxes at the lowest possible cost, to use the most economical method of transporting to and from the various factories, raw materials and finished product.

Horses require as much care when not in use as on working days. John Leggett & Son realized this fact, and, after investigating motor trucks, decided in favor of the FEDERAL.

Their FEDERAL No. 1306, went into service at Hudson, N. Y., during August 1913.

They Buy "Another"

The following year in March, 1½-ton FEDERAL No. 1673 was purchased for use at Troy, on the performance of the first one.

A letter received from G. W. Calkins, driver of the FEDERAL in this city will show what that truck has been doing, and the satisfaction given to all concerned:

"There are quite a few FEDERALS here now and a number of buyers looked at mine. I certainly gave it a good recommendation. Last Monday I went from Troy to Rock City Falls and back, 83½ miles; made on an average 12 miles per hour with 1½ tons. About 15 miles were very sandy and muddy, very heavy road, and I used 12½ gallons of gasoline on the trip.

"Some days I do not run the FEDERAL at all, but it is always ready when I want to use it."

Careful Records Kept at Troy

Mr. Calkins adds—

"Mr. A. J. Burch keeps tabs on the machine here and the one at Hudson and he boils down facts and figures and can tell monthly just what both cars are doing."

Regarding these records Mr. Burch says: "The information is kept entirely for ourselves, but we are satisfied with the results of our ownership of FEDERAL trucks."

Service at Hudson

We received records of the truck at Hudson, covering 10 months' operations during 1915. These records are not complete but will show what the truck was doing.

It averaged 7.04 miles per gallon of gasoline and 28.71 miles per pint of cylinder oil. The average round trip distance was rather long—19.88 miles.

Month 1915	Trips	Miles	Gallons Gasoline	Pints Cyl. Oil
January	25	575	95	23
February	32	696	124	23
March	45	989	155	26
April	41	857	119	24
May	47	938	125	27
June	47	857	119	24
July	53	980	136	29
August	48	922	131	35
September	53	939	123	42
October	58	1176	141	58
TOTALS	449	8729	1268	311

The accompanying photograph of Leggett & Son's FEDERAL at Hudson is an illustration of a good type of body for such light, bulky loads as paper boxes form.

Even with the boxes piled as high as possible the load will seldom be near capacity, but FEDERAL economy will still be evident.

Best by Name and Best by Nature

Mr. F. A. Best, the driver of FEDERAL No. 1306 at Hudson, is certainly to be commended for the excellent care he has given his FEDERAL. It has been his special charge and he takes care of it just as if his personal happiness depended upon it.

Best also believes in our Daily Service Records, and beginning with January 1916, has sent in records every month. The 'Best' drivers are always interested in daily records.

Month	Days Op'd	Trips	Loads Del.	Loads in Lbs.	Miles	Gals. Gas.	Pints Cyl. Oil
Jan.	21	28	30	33600	403	106	20
Feb.	11	18	22	22550	383	73	18
March	3½	7	9	8850	158	38	7
April	23	46	49	64980	973	136	35
May	23	58	61	86300	1147	157	56
June	22	57	62	85300	1140	139¼	34½
July	22	50	54	77400	981	120½	35
August	27	61	63	92400	1160	141½	39½
Sept.	21½	69	70	107800	1000	127½	33½
October	24½	70	71	103000	1264	154	44½
Nov.	21	60	65	87500	1019	126	38
Dec.	19	51	54	79241	676	89¾	26
TOT'L	238½	575	610	848921	10304	1408½	386

For this year the truck averaged 7.31 miles per gallon of gasoline,—26.69 miles per pint of oil. An average of two trips were made each day, carrying 1476 pounds each trip. Again the long trips are in evidence, the average round trip being 17.92 miles.

Five Months in 1917

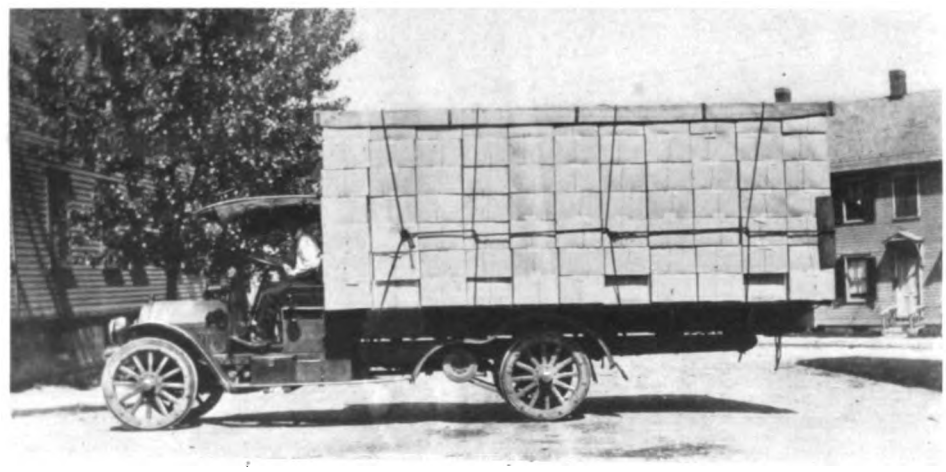
The records for May have just been analyzed and the results are given below with the other records for this year:

Month	Days	Trips	Del.	Loads in Lbs.	Miles
January	13	51	51	92600	367
February	19	40	91	75784	512
March	25	67	84	107600	855
April	23	58	61	101945	894
May	23	63	88		981
TOTALS	103	279	375	476129	3609

Month	Gals. Gas.	Pints Oil	Time Loading Hrs.-Min.	Time Running Hrs.-Min.
January	51	13	31-50	67-55
February	90½	27	26-55	126-15
March	131	48	53-25	150-45
April	121½	37	41-15	142-25
May	128	42	59-15	145-50
TOTALS	522	167	212-40	633-10

The daily averages for this year are practically the same as in 1916—2 trips, 3 deliveries per day with an average load of 1706 pounds. The truck traveled 6.89 miles per gallon of gasoline and 21.61 miles per pint of cylinder oil. Two hours were consumed each day in loading or waiting for orders, and the average running time per day was 6 hours 10 minutes. However, this running time includes unloading and all time spent away from the factory. Approximately 45 minutes is spent at the unloading point for each delivery; thus 2 hours 15 minutes would be consumed while unloading—leaving 3 hours 55 minutes for running time including delays. During this time the truck traveled over 35 miles per day.

"A. Best" driver and the best truck form a combination that is hard to beat.



This FEDERAL Makes Over 1000 Miles Per Month—Delivering Paper Boxes

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Good Words From FEDERAL Owners and Drivers

Utah Gas and Coke Co., Salt Lake City, Utah—Public Service.

We have just received the report of the inspection made by the White-Savage Motor Co., of Salt Lake City, your dealers, on our two-ton FEDERAL. Our thanks are due them for their prompt and fair attention to us in the matter of service.

In this connection we want you to know that our FEDERAL truck is the only one of four trucks owned by this company which has been in constant service this winter.

We have a ————, a ————, a ————, and a FEDERAL truck and with the exception of the FEDERAL they have all been laid up for repairs at various times through the hard winter which we have had.

This record made by the FEDERAL is made possible by the careful inspection regularly made by the White-Savage people, which will undoubtedly have a strong bearing on our decision in the future on our purchases of motor trucks.

John H. Ford, Norwich, Conn.—Ice.

My FEDERAL truck is doing fine work. I use it to supply my retail wagons and to draw to the depot. Last Saturday it made seven loads and used seven gallons of gasoline at 14c per gallon, drawing about 18 tons for the day's work.

It can do more work than this if I require it. Its work is very satisfactory.

Cross County Run from Los Angeles to Fresno, Calif.—New FEDERAL Five-ton.

Dealer's letter regarding this 250-mile trip says:

"The truck is certainly a wonder and has excited considerable interest already. The boys driving it report to the writer that they came over the 'Ridge' in fourth gear, having never had to shift a gear on the entire trip except when starting. This is quite a stunt and speaks very highly for a new FEDERAL Motor. We doubt if there is any other truck on the market that could climb this same hill called the 'Ridge' in this manner."

Albany Fruit Co., Albany, Ore.—Fruit Dealers.

We are using a ton and a half FEDERAL truck and would like to have you send us TRAFFIC NEWS telling of other FEDERALS. We have been using a truck for nearly two years and know of no other make that gives better service.

Morton Bros., Toledo, Ohio—Trucking.

In March, 1915, we put into service a 1½-ton FEDERAL truck.

We have had excellent service from this equipment and some idea of its efficiency may be gained from the large mileage on tires which we have obtained.

We believe that it is a good indication of the manner in which the truck runs and its general service. We expected to get the usual guarantee of 7,000 miles per tire but when the rear tires were renewed in May, 1916, we found that they had gone over 16,000 miles.

That sounded good, of course, but the record, however, is now way behind that of the tires on the front wheels on the same truck. Up to the present time, January, 1917, they have gone over 30,000 miles and are still in fairly good condition.

Baker & Lockwood Mfg. Co., Kansas City, Mo.—Tents and Awnings.

Yes, sure we'll recommend your truck.

We bought the first one you sold in Kansas City, four years ago. We were induced to do it by hearing about it through disinterested parties living in Detroit, Mich., where it was made and where it had captured all truck users.

Won't it do to say that after three years' use of the first FEDERAL, we purchased another? This is making good. We have two other makes of trucks but yours pleases us best for our purpose.

H. N. Queen, Elkhart, Ind.—FEDERAL Driver.

This FEDERAL which I am driving has run over 11,000 miles.

The motor has never been down or have any of the valves been ground. There has been no adjustment of any kind.

There has never been a truck in my own personal experience that has needed so little repairing as this FEDERAL. I am proud to be the driver of a truck with such a record as No. 5172.

Paul Bros., Concord, N. H.—Wholesale and Retail Auto Supplies.

We cannot speak too highly of the merits of the FEDERAL truck. It has been in constant service for over a year and we have had to spend absolutely nothing for repairs. It is very economical on gasoline and oil. If we were to put on another truck it would be a FEDERAL without looking any further.

Conyers Coca-Cola Bottling Co., Conyers, Ga.—Bottling.

We like our FEDERAL truck very much, in fact, better than any truck we have ever used. It has given us no trouble at all and we prefer it to any truck on the market.

Christopher-Thurber Grocery Co., Trenton, Mo.—Groceries.

Our ton and a half FEDERAL truck which we recently put into commission has not given us a moment's trouble and has been doing the work formerly done by several teams. We are more than pleased with it and it has proved to be more than we expected as a saver of expense.

That is not the only feature, either, our customers appreciate the better service we can give on delivery and there is no little value attached to it from our standpoint as an advertising feature.

Two FEDERALS that are Doing Good Work in a Southern State



Live Stock in 150 Mile Trip Across Texas



Carrying Uncle Sam's Mail in the Pan Handle State

THE animals shown on the FEDERAL herewith were prize winners at the Fort Worth Fat Stock Show at Fort Worth, Texas, recently and are valued at $1,500 each.

So valuable were they that after their purchase they were shipped to Lubbock, Texas, by railway from Fort Worth. Thence hauled 150 miles over Texas plains, in this FEDERAL to the ranch of Mr. Ivey, their new owner just over in New Mexico. The animals were not allowed to exert themselves by traveling on the hoof.

More and more prevalent is this method of hauling live stock in the Southwest on the farms and ranches where distance is everything. Valuable stock cannot be subjected to the tiring trips across the dry desert and plains.

Difficulty in shipping animals by train in the Southwest, owning to the lack of adequate railroad facilities and danger of sickness in the cattle cars, also makes their hauling by truck the better method.

We will, at a later date, show other instances of this kind of FEDERAL hauling.

SPEEDING up the mail is just as much a necessity before and after it leaves the Railway Mail Clerk's hands as it is then. Down in Sweetwater, Texas, this 1½-ton FEDERAL owned and operated by the Sweetwater Transfer Company, carries mail between railway stations. A few years ago this was done entirely with horses and sometimes more than one trip had to be made with the team to get the mail across the city. The FEDERAL never complains of being loaded high with letters and Parcel Post and there are no delays in taking it from one railroad to another.

Despite the unusual demand on this truck, the repair expense for the year which it has been in service, has been very low and the truck has never failed to be ready for service either day or night, twenty-four hours of the day.

The Sweetwater Transfer Co., owner of this truck, has replaced scores of horses with FEDERALS. They report thorough satisfaction in every instance.

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BOCK

Everything Rolls

In the Bock Bearing *every* load carrying contact—radial as well as thrust—is a frictionless rolling contact.

The *end* of each roller bearing is *rounded*, and, being spherical in shape, *rolls* where other bearings scrape and slide.

It combines the good features of the ball bearing with the greater load capacity of the roller bearing.

That is why the Bock Bearing is replacing all other types used in motor cars as rapidly as we can produce them.

The BOCK BEARING Co.
Toledo, Ohio

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Kelly-Springfield

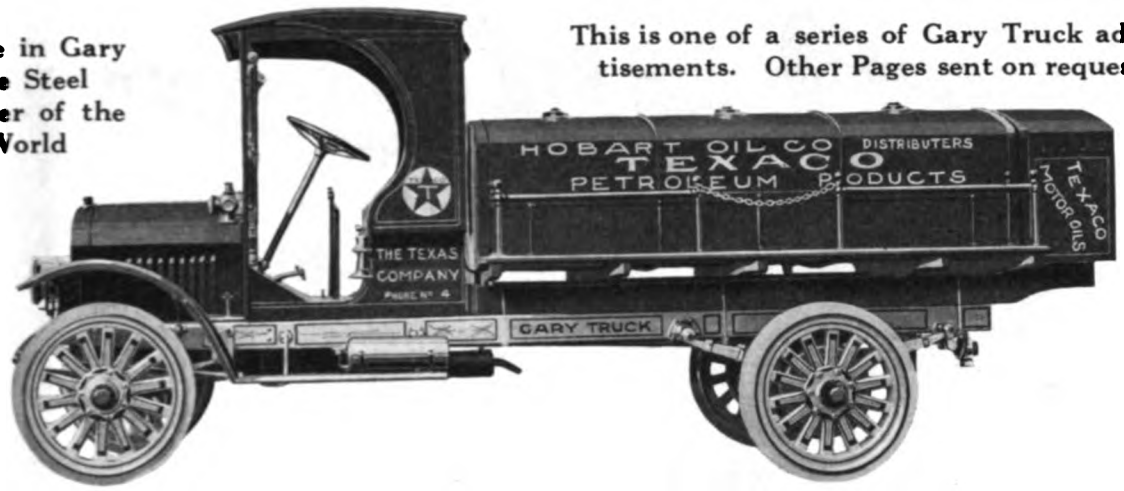
Truck Tires

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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Made in Gary
the Steel
Center of the
World

This is one of a series of Gary Truck advertisements. Other Pages sent on request.



Another Gary Truck in the service of a large corporation. Watch the August Issues of Commercial Vehicle

In the Supreme Test of Commercial Service

GARY WORM DRIVE TRUCKS

Make Good

5 Models
All Worm Drive

A Serial

CHAPTER II

Modern truck service makes severe demands on rear axles.

For over 50 years SHELDON has been building axles for heavy duty commercial use, and has concentrated on this problem, the ability of an entire organization, combining manufacturing experience and highest engineering skill with an up-to-the-minute equipped plant and large resources. The result is—

The Most Serviceable Truck Axle in America

Axles are one of the greatest single factors in fixing the performance ability, reliability and economy of a motor truck.

SHELDON AXLES

are used as standard equipment on all models of GARY Trucks.

(To be continued in the August 1st issue.)

Where well-known trucks of old established manufacture have formerly held sway, you can now often find GARY Trucks working along with them—shoulder to shoulder—or taking their places entirely. An occasional instance of the kind might have only passing value—but such instances with GARY are coming, rather than the exception, to be the rule.

GARY Trucks are now being built in a modern new factory, which triples their former maximum capacity production. Such an output makes it certain that there will be no shortage of GARY Motor Trucks for domestic service.

Write for our complete catalog.

JUDGE GARY Trucks for Yourself.

THE GARY MOTOR TRUCK COMPANY

Manufacturers

Branch Sales Office, 1211 Hartford Bldg., Chicago **General Offices, Gary, Indiana**

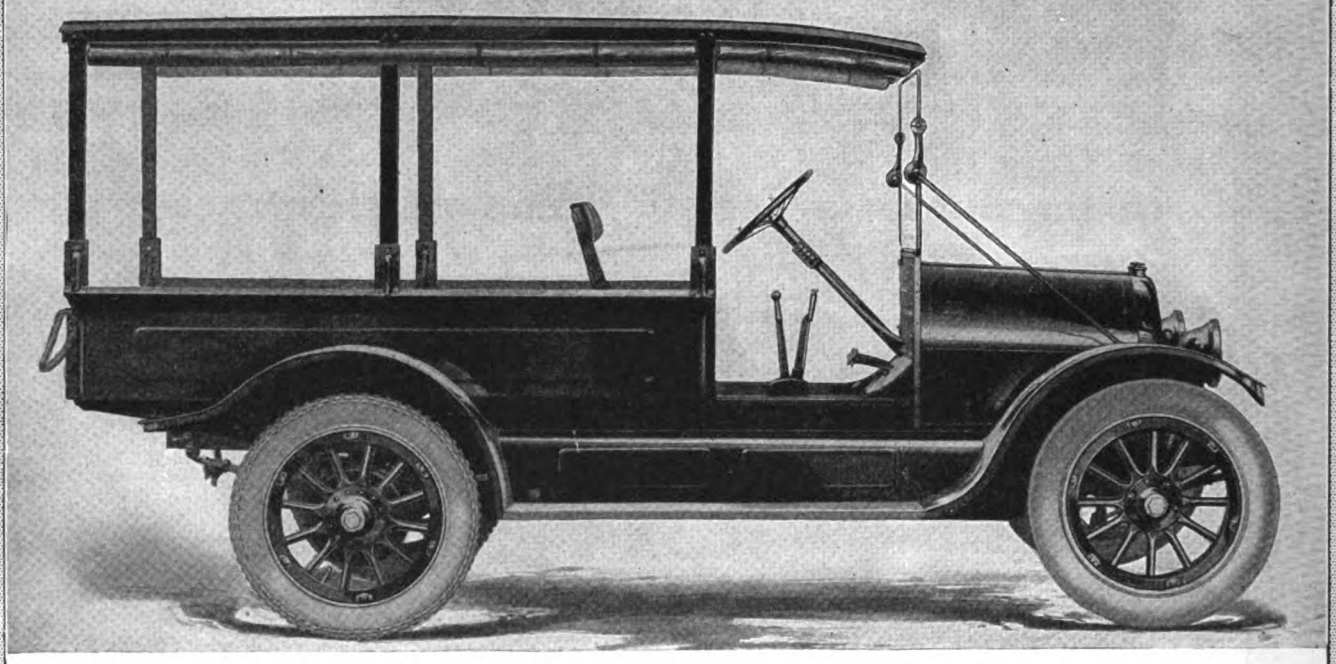
Koehring Machine Co., Northwest Distributors, Portland, Oregon, Seattle, Washington, Spokane, Washington
Gary Motor Truck Sales Co., Distributors, 4150-52 Olive St., St. Louis, Mo.
Bergstedt Bros. Co., Distributors, 167-171 W. University Ave., St. Paul, Minn.

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Overland

TRADE MARK REG.

1200 lb.
Delivery Wagon
Express Type
$850
Chassis $800
f. o. b. Toledo
Prices subject to change without notice



Profitable and Practical Delivery Service

Now as never before it is important for you to speed up your deliveries.

The 1200 lb. Overland Motor Wagon shown above is the type that merchants have found profitable and practical for their delivery service.

Profitable, because it has the stuff in it that will stand up under the wear and tear of *steady* service. With ordinary care an Overland will do its work just as faithfully the second or third year as it does in the beginning.

And it is practical in every sense of the word. It is light, quick and easy to handle—has oversize mileage-giving tires both front and rear—is completely equipped with every time-saving convenience, such as electric lights and starter, speedometer, ammeter, etc.

No matter how large or small your business may be, an Overland Delivery Wagon or a fleet of Overlands will reduce your hauling costs and increase your trading radius.

Overland service has solved the delivery problems of thousands of merchants. Why hesitate or experiment?

See the nearest Overland dealer today. Ask him for a practical demonstration.

G.S.C. GUARANTY PLAN

Buy it on Guaranty Time Payments

Willys-Overland, Inc., Toledo, Ohio
Overland and Willys-Knight Automobiles

Willys-Overland Motor Cars

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Firestone

Truck Tires

BIG transportation problems have furnished the necessity that was the "mother of the invention" of Firestone Giant Truck Tires. First in the field. Three years ahead of all other truck tires. Bigger in superb rubber bulk; greater in both road-holding and traction ability; a more massive, resilient cushion to the load; big saving in fuel; the sum total of all that insures Most Miles per Dollar.

There are many other Firestone types, each as efficient in its class. Call in the Firestone man.

FIRESTONE TIRE AND RUBBER COMPANY, AKRON, OHIO
Branches and Dealers Everywhere

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Announcing ANOTHER COVERT FACTORY



At Detroit

IN response to the increasing demand for Covert Transmissions of the motor truck type, we are pleased to announce the establishment of an additional motor truck transmission factory at Detroit.

This plant is a modern 5-story building—designed and built for manufacturing purposes only. It has a production capacity of 200 transmissions per day in addition to the regular daily output of the parent factory at Lockport, N. Y.

Catering particularly to the motor truck trade of which Detroit is the center, this new plant will specialize in the production of the Covert "unit" and "amidship" models of truck transmission—both 3-speed and 4-speed types.

The Detroit plant is being operated in conjunction with the Lockport factory, and is under the management of Alwin A. Gloetzner, resident Sales Manager and Chief Engineer.

The plant has been installed with the equipment necessary to enable us to get into immediate production.

The Covert Gear Company, Inc.

Sales Engineering and Service

967 Woodward Ave.
Detroit, Mich.

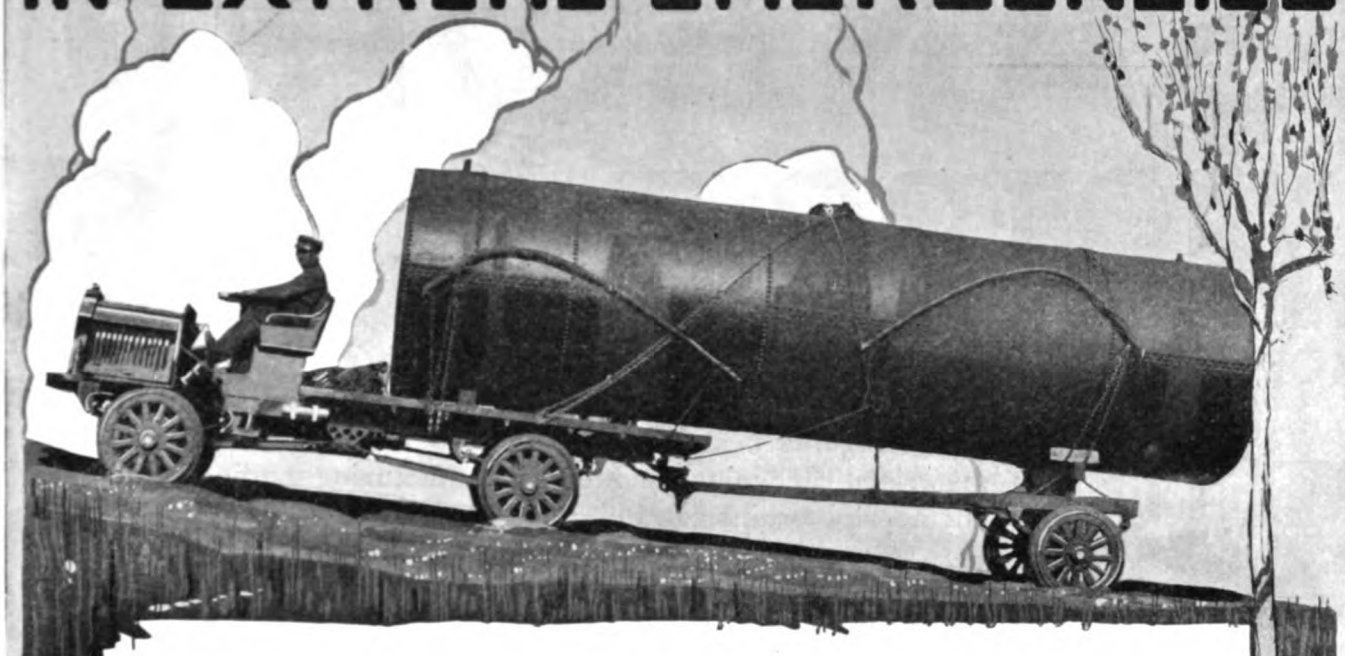


Factories:
Lockport, N. Y.
Detroit, Mich.

At Lockport

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DUPLEX RESERVE POWER ASSURES DEPENDABILITY IN EXTREME EMERGENCIES



THE tremendous reserve power of the Duplex—the original 4-Wheel Drive 3½-Ton Truck—is applied four times more effectively than is possible with any other type of motor truck.

That is why the Duplex is known throughout the country—in industrial centers, logging camps, gravel pits, mining districts, deserts and oil fields—as a super-strength motor truck that hauls capacity loads anywhere.

One source of Duplex dependability under most adverse road conditions is found in the Duplex-Adler self-locking differential, which automatically throws the power to the wheel or wheels having traction.

Another source of Duplex effectiveness of reserve power lies in the range of gear reduction made possible with the Duplex Chain Case—an exclusive Duplex truck feature

The Duplex Chain Case reduction gives the Duplex a draw-bar pull four times greater than that of any rear-wheel drive truck, and makes it practically impossible to stall the Duplex even when trailers are being pulled through hub-deep mud and up embankments.

The Duplex Chain Case, by means of a silent chain belt, transmits the power from the main propeller shaft to the shafts driving the front and rear axles. A reserve chain provides an additional two to one gear reduction whenever needed. This chain case reduction practically doubles the power applied to the four wheels. It provides a tremendous leverage of 64 crankshaft turns to every revolution of each of the four wheels, and makes it possible for the Duplex to haul three and one-half ton loads under up-grade conditions that any rear-wheel truck would find difficult to negotiate when unloaded.

Our 1917 catalog explains in detail the many exclusive mechanical features of the Duplex, while our engineers will give you facts and figures for your particular business. If you would reduce your haulage costs to the absolute minimum, let us send you complete information about the Duplex—the truck that hauls capacity loads anywhere.

To Dealers—Duplex production is about to be increased and an opportunity is opened to established, high grade distributors. Wire or write for our dealer proposition.

The Duplex 3½-Ton Truck, shown above, hauled this large oil tank over country roads a distance of nearly 30 miles. The tank, which is 7 feet in diameter and 28½ feet long, weighs 8½ tons. The Duplex hauled its burden through sand and mud and up steep hills, and clearly demonstrated that it is equal to any hauling emergency.

ADDRESS ALL COMMUNICATIONS TO DEPARTMENT 107

DUPLEX TRUCK COMPANY

LANSING, MICHIGAN

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INTRODUCING THE NEW WORM DRIVE LINE OF SANFORD MOTOR TRUCKS

BACKED by an organization that knows no limitations in producing the best line of motor trucks that men, money, materials, recognized modern manufacturing methods, and engineering brains can build.

We do not claim that the Sanford Truck is going to be the greatest whirlwind seller within a few months since the introducing of motor-propelled hauling equipment.

We do not claim that the dealer will corner the market or that he will become independent overnight.

We claim merely that any live, energetic, up-to-snuff dealer with a stiff backbone and an opportunity of demonstrating, point for point, the big features of the Sanford Truck, will joy in the battle of competition, knowing he is fighting a winning fight.

We have a proposition for such dealers—a proposition gilt-edged, broad, profit-producing. The radius of each dealer's territory will depend wholly upon his ability to properly swing it and show his worthiness. Then he'll get the territory and the protection he's entitled to.

Send for our plan *today*. Ask for the Sanford Truck specifications and complete details of this sturdy equipment. The right men will have one of the best opportunities in the trade today. Deliveries are assured.

2½-ton, 3½-ton, 5-ton Worm Drive
1-ton and 2-ton Internal Gear Drive

PLEASE MENTION THE COMMERCIAL VEHICLE WHEN WRITING TO ADVERTISERS

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Specifications

Model "35" 3½-ton Sanford Truck

Capacity—Normal load, 7,000 lbs. Maximum permissible weight on rear tires, 12,000 lbs.; on front tires, 4,700 lbs.

Speed—Motor governed to maximum speed of 1,100 r. p. m., giving a truck-speed of 13 miles an hour on high gear.

Chassis—Standard length of wheel base, 174". Chassis length back of seat, 12". Chassis frame width over all, 35".

Standard Equipmsnt—Side and tail lights, mechanical horn, tool box and kit, jack, oil can.

Cab—Full cab furnished as regular equipment, equipped with complete set of storm curtains.

Motor—Mounted in front under hood. "L" head type, four cylinders, 4½" x 6", cast en bloc. Three point suspension. Develops 37½ h. p. at 1,000 r.p.m. Mounted so as to be readily accessible without removing from frame. Ignition, high tension magneto. Carburetor, 1½" side outlet. Lubrication, geared pump, force feed system. Cooling, centrifugal water pump. Fan, steel construction; belt tension adjustment.

Clutch—Borg & Beck three-plate dry disc clutch of large diameter, attached to fly wheel of motor and entirely enclosed by castiron housing attached to bell housing of motor.

Transmission—Four speeds forward and one reverse, with maximum reduction on low gear of approximately 5-1. Intermediate speeds arranged in geometrical ratio. Connection between transmission and rear axle shafts by means of two Spicer Universal Joints with tubular drive shaft and splined slip joint. Universal Joints provided with grease covers to insure proper lubrication at all times and prevent dirt and dust from working into bearings. Gear shift lever mounted in center and gears are operated on selective principle. Fourth speed is direct drive.

Springs—Semi-elliptic, front and rear, full alloy steel properly heat-treated. All spring eyes bronze bushed. Front springs 3" wide, 40" long; rear springs 3½" wide, 54" long. Special type of spring hanging provided on rear springs.

Wheels—Heavy artillery type with spokes mounted centrally in felloe. Front spokes 2¼" square, rear spokes 3" square. Rear wheels special construction preventing water or dirt from working between spoke and felloe. Fourteen spokes in both front and rear wheels.

Brakes—Emergency and service brakes mounted on rear wheels. Both brakes internal toggle wrap-up type. 2½" wide, 20" in diameter. Brakes enclosed, protecting them from oil and grit and prolonging the life of lining.

Drive—Worm drive, made by Sheldon Axle & Spring Co.

Frame—Pressed steel; side channels 8" deep, 3" top and bottom flange, ¼" stock, made from special frame dies. Pressed steel cross members used at points where rigidity in frame is desired.

Tires—Standard equipment; front 36 x 5, single, solid; rear, 36 x 5, dual, solid. Tread, center to center of front wheels, 62"; tread, center to center of rear wheels, 66".

SANFORD MOTOR TRUCK COMPANY
102 St. Marks Avenue - - - - - Syracuse, N. Y.

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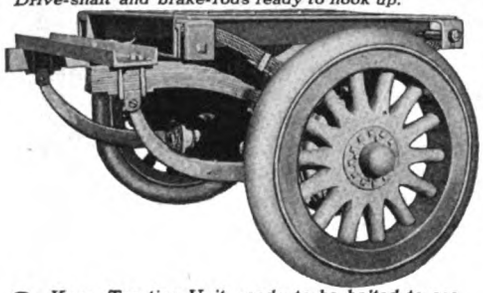
Knox

2 ton $390
3 ton $570
5 ton $750

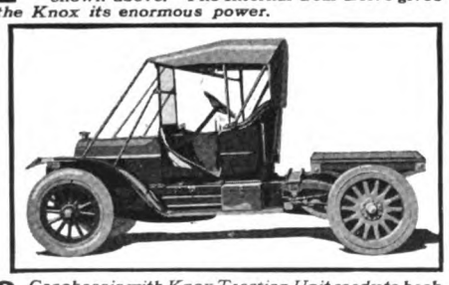
TRACTION UNIT



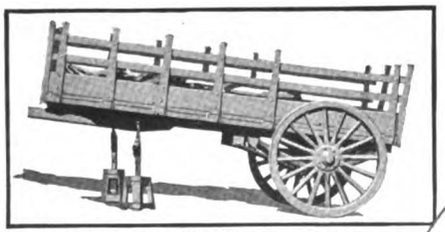
1 *Any pleasure car, ready for Knox Traction Unit. Body cut off, rear axle and springs removed. Drive-shaft and brake-rods ready to hook up.*



2 *Knox Traction Unit, ready to be bolted to car shown above. The Internal Gear Drive gives the Knox its enormous power.*



3 *Car chassis with Knox Traction Unit ready to back under front end of Load Carrier shown below.*



4 *Any horse-drawn wagon or truck with front axle removed. It is jacked up to receive tractor shown above.*

Biggest Dealer Opportunity in the History of the Business

The Knox Traction Unit combines any new or used pleasure car or truck with any horse-drawn wagon and forms a hauling outfit of 2, 3 or 5 tons capacity. Read the description under the pictures to the left, and see how the Knox works. Then, think of your opportunity as a dealer with a proposition that instantly appeals to every merchant, manufacturer, farmer and every other owner of horses and wagons in the land.

Easier than selling motor trucks. The only thing that keeps everybody from having motor trucks is "because it costs so much to change from the present horse-and-wagon system." With the Knox it *doesn't.* Your prospect can get big money for his horses and he already has the necessary wagons.

Easier than selling pleasure cars. With the Knox there is no time or money wasted in "finding the customer." Every chimney, every store, every farm, every factory shows you where the Knox *is needed.* To demonstrate it there is to sell it there.

Trade-ins unnecessary. The Knox dealer forgets trade-ins. It's the only motor proposition on earth where the owner's old car is a help to him and to the dealer.

Helps sell pleasure cars. Every Knox Traction Unit sold means one less used pleasure car on the market. And to replace the car to be used as the power plant of the Knox outfit, ***you can sell the customer a new pleasure car.*** Two profits at the expense of getting one.

Three Sizes. Model B, 2 tons capacity, $390. For cars like Ford, Chevrolet, Maxwell, small Buick, etc.

Model A, 3 tons capacity, $570.

Model C, 5 tons capacity, $750.

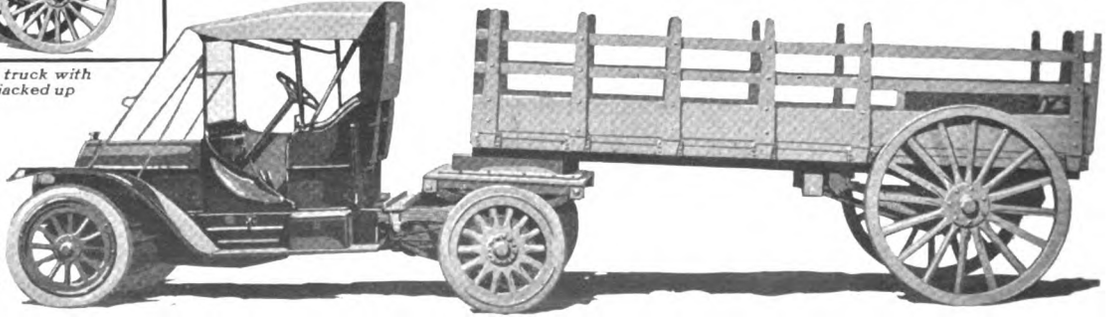
Big National Advertising on the way. See Saturday Evening Post, June 9th and 30th—just a starter.

Get Busy. Look us up in Dun's or Bradstreet's, consider the unlimited sales possibilities of the Knox, and in the meantime, write us for dealer particulars. Some good territory is still open, so *get busy.*

KNOX MOTORS ASSOCIATES, Springfield, Mass.

Seventeen Years of Motor Vehicle Building Experience

Distributors also of the famous Knox Tractor and the Knox 300-h.p. Aircraft Engine



5 *Complete hauling equipment of 2, 3 or 5 tons capacity. Will go anywhere, move anything, keep doing it, like a motor truck costing up to $5,000.*

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Energizing a Nation

The whole world now looks to America for action. Our nation must marshal all its forces. Every one of its millions of motor vehicles must do its share.

The great Continental army of motor trucks is in motion. In war as in peace the Continental Motor is energizing America—moving its burdens, transporting its armies, gearing the nation to a higher speed. Now, as always, it serves—efficiently, loyally. More than ever, it justifies its proud title of America's standard motor.

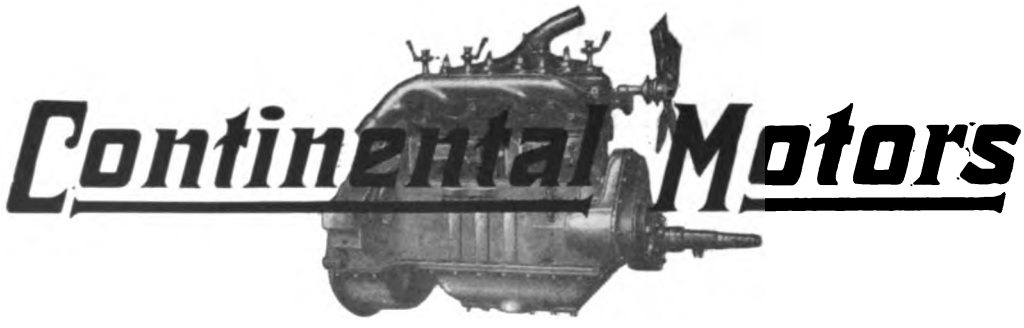
You, too, can energize your business with Continental-powered trucks.

CONTINENTAL MOTORS CORPORATION

OFFICES: Detroit, Michigan

FACTORIES: Detroit—Muskegon

Largest exclusive motor manufacturers in the world



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Republic Truck Tires
are made of
Prōdium Process Rubber

THIS wonderful rubber makes tires last longer.

It gives them great resistance against heat.

It makes them almost immune to road cuts and chipping.

They wear down as evenly and smoothly as a piece of steel.

They grip the road and are springy and responsive to a remarkable degree.

Republic Truck Tires are laminated.

They are built up, ply on ply, so that there is no splice to give way under hard usage.

Try them out against any tire of like size. You'll find they last longer.

The Republic Rubber Company, Youngstown, Ohio

REPUBLIC TRUCK TIRES

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These Specifications and This Price Know No Competition

Carrying Capacity—3000 pounds.

Frame Construction—4" steel channel—heavily reinforced with four cross members.

Rear Axle—1¾" x 2¼" section—2⅛" spindles—heat treated.

Bearings—Bock roller—rated to carry 10,000 pounds.

Radius Rods—Heavy steel of special design with the exclusive Phenix chain adjustment.

Springs—2½" wide, 44" long.

Lubrication—All wearing parts fitted with grease or oil cups.

Wheels—32" x 3½"—12"—2" square spokes—2nd growth hickory.

Tires—32 x 3½ standard pressed—on type.

Drive—Baldwin chains on special analysis steel sprockets.

Gear Ratio—Standard 7 to 1.

Brakes—3" x 12" Internal Expanding—Positive in action.

Wheelbase—125".

Tread—Standard 56".

Loading Space—9 to 11 feet back of driver's seat, according to body.

Weight—Attachment only—1100 pounds.

Price—$350.00 F.O.B. Chicago.

1½ Ton Capacity $350

Phenix TRUCK 3000 LBS. CAPACITY $350 MAKER

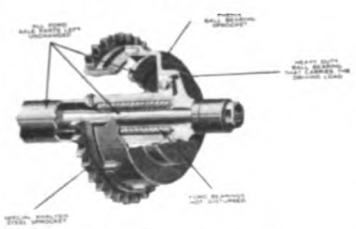
Carries 90% of the Load—Prevents Broken Rear Axles

The Ford power plant is built to carry the ordinary equipment and body of the Ford passenger car, plus five passengers, at most. Its surplus strength is sufficient to care for ordinary overload. It does the work for which it is built.

But the Ford power plant will *pull* many times the weight it will carry—and on this basis the PHENIX Truck Maker is built.

There is no danger of overloading the power plant of the PHENIX Truck Maker, or of putting undue strain on the motor. At no time is the motor or car—even when hauling the maximum load—subjected to greater strain than when traveling at moderate speed as a pleasure car. The PHENIX Truck Maker—with its massive construction and broad, heavy, artillery type wheels, *carries 90% of the load,* safely and easily. *The Ford part of the unit merely pulls it.*

And, besides, ball bearings in the bell housings of PHENIX relieve Ford axles of strain and prevent breakage. Extra heavy springs carry the load with ease, and the efficient brakes operate metal against metal.



Special Ball Bearing Sprocket Prevents Rear Axle Trouble

Write for complete details regarding the PHENIX. *DEALERS and USERS, mail the coupon now.*

PHENIX TRUCK MAKERS, Inc.

2337-39 South Michigan Ave. CHICAGO

Use The Coupon Now

PHENIX TRUCK MAKERS, Inc.,
2337-39 S. Michigan Ave., Chicago.

Send me full information at once regarding PHENIX Truck Makers—the biggest dollar for dollar profit maker in the converting unit field.

Name. .....

Address. .....

If a dealer check here.....

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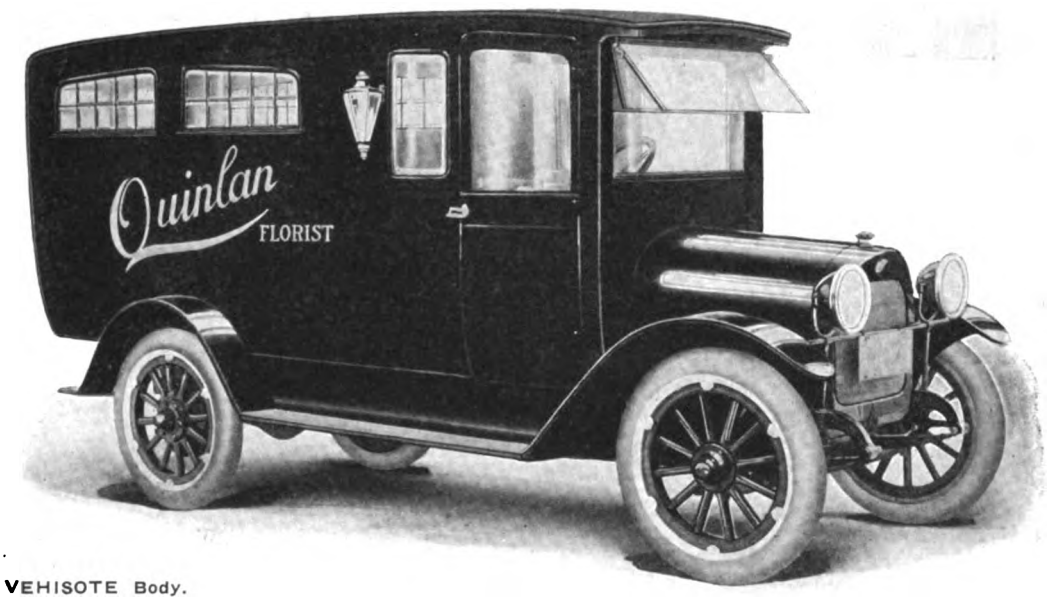
VEHISOTE

Has No Grain No Laminations

Side panels consist of one large sheet of VEHISOTE—crackless—jointless—flowless. The checking and blistering, the gaping seams, which are so unavoidable in wooden panels, are impossible with this impervious, one-piece material.

VEHISOTE is waterproof, impervious to climatic conditions, takes and holds paint equal to wood, can be given a very beautiful finish and grows stronger with age.

VEHISOTE is not a substitute for wood in vehicle body building. It is a scientific and positive improvement over wood or any other material for the purpose.



VEHISOTE Body.
Built by August Schubert Wagon Company, Oneida, N. Y.

THE PANTASOTE COMPANY

11 Broadway, New York **People's Gas Bldg., Chicago**

JOBBERS

Scovel Iron Store Co.
San Francisco, Cal.
Gerhab & Ludlam
Philadelphia, Pa.
C. H. Tiebout & Sons
Brooklyn, N. Y.
Wm. E. Kleine & Co.
New York City
E. C. Kadow & Co.
Chicago, Ill.
W. T. Crane Cge. Hdwe. Co.
Newark, N. J.
Mossman-Yarnelle & Co.
Fort Wayne, Ind.
Sligo Iron Store Co.
St. Louis, Mo.
H. D. Taylor & Co.
Buffalo, N. Y.
N. Langler & Sons
Brooklyn, N. Y.
H. Hett & Sons
New York City
Haury Hardware Co.
Cleveland, Ohio
John C. Hills
Trenton, N. J.
Wm. Stockhoff
Louisville, Ky.

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MASTER
TWO TON TRUCK
$2250 F.O.B. CHICAGO

The Greatest 2-Ton Truck And We Can Prove it!

MASTER Two-Ton Truck designers and builders have devoted 14 years in concentrated study upon the strong and weak points of other motor trucks under every day hauling conditions.

With this vast experience as a guide they have designed and built a motor truck with every one of these weaknesses eliminated and every strength intensified, making Master Two Ton Truck capable of rendering unusually efficient and economical service continuously under every known hauling condition.

A Big Money Maker for Dealers

Present Master Two-Ton Truck dealers are enjoying a success heretofore unknown in the motor truck field. Experienced motor truck buyers readily appreciate the many marked advantages of Master Two-Ton Truck construction, and sales everywhere in the country are increasing rapidly.

Write at once for our big book on Master Two-Ton Truck construction and the sales opportunity awaiting live dealers.

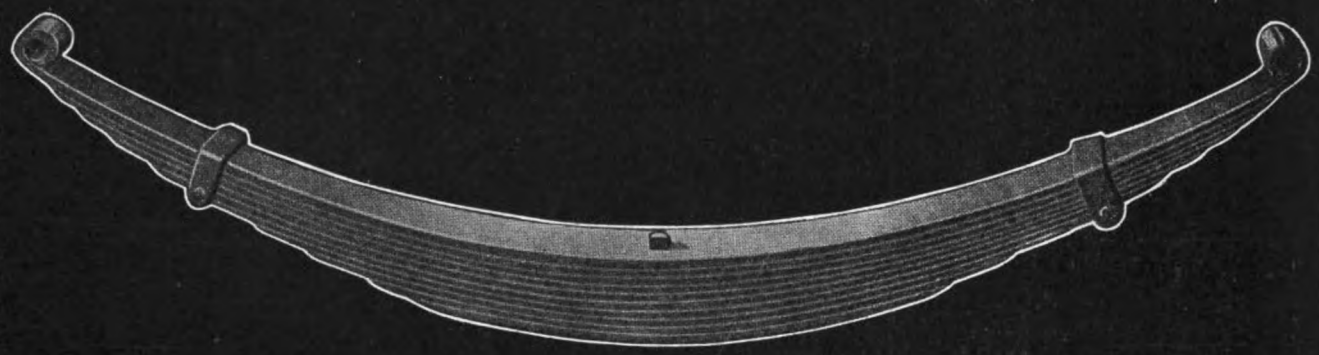
MASTER TRUCKS, Inc., 3132-36 Wabash Avenue, Chicago, Ill.

Send your free book and dealer proposition on Master 2-ton truck.

Name.....
Street Address.....
City.....State.....
Dealer?.....User?.....

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"The Spring Is the Thing"



MATHER

Scientifically Heat-Treated

SPRINGS

designed to insure

Maximum of Elasticity and Endurance

with

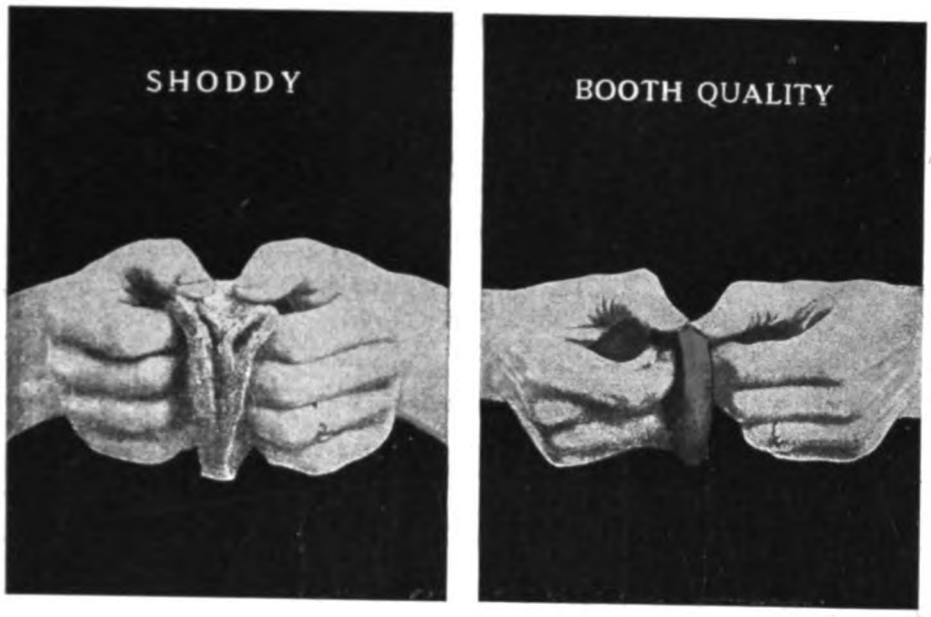
Minimum of Vibration

Genuine made only by

The Mather Spring Company

Toledo, Ohio

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"Get the Quality" **Booth** *"Get the Quality"*

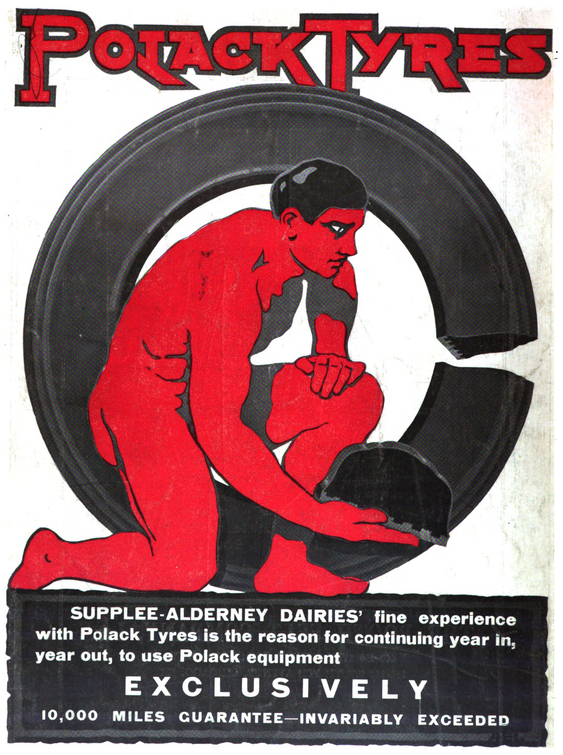
IF you buy felt washers simply by the price, you can always find some that are lower priced than ours. But if you care for quality, service and perfection, BOOTH'S are the lowest priced washers made.

Send your prints and specifications to

THE BOOTH FELT COMPANY, Inc.

440-450 19TH STREET, BROOKLYN, N. Y.
116-118 SOUTH 5TH AVENUE, CHICAGO, ILL.

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Electrics Deliver Untainted Butter

The Commercial Vehicle

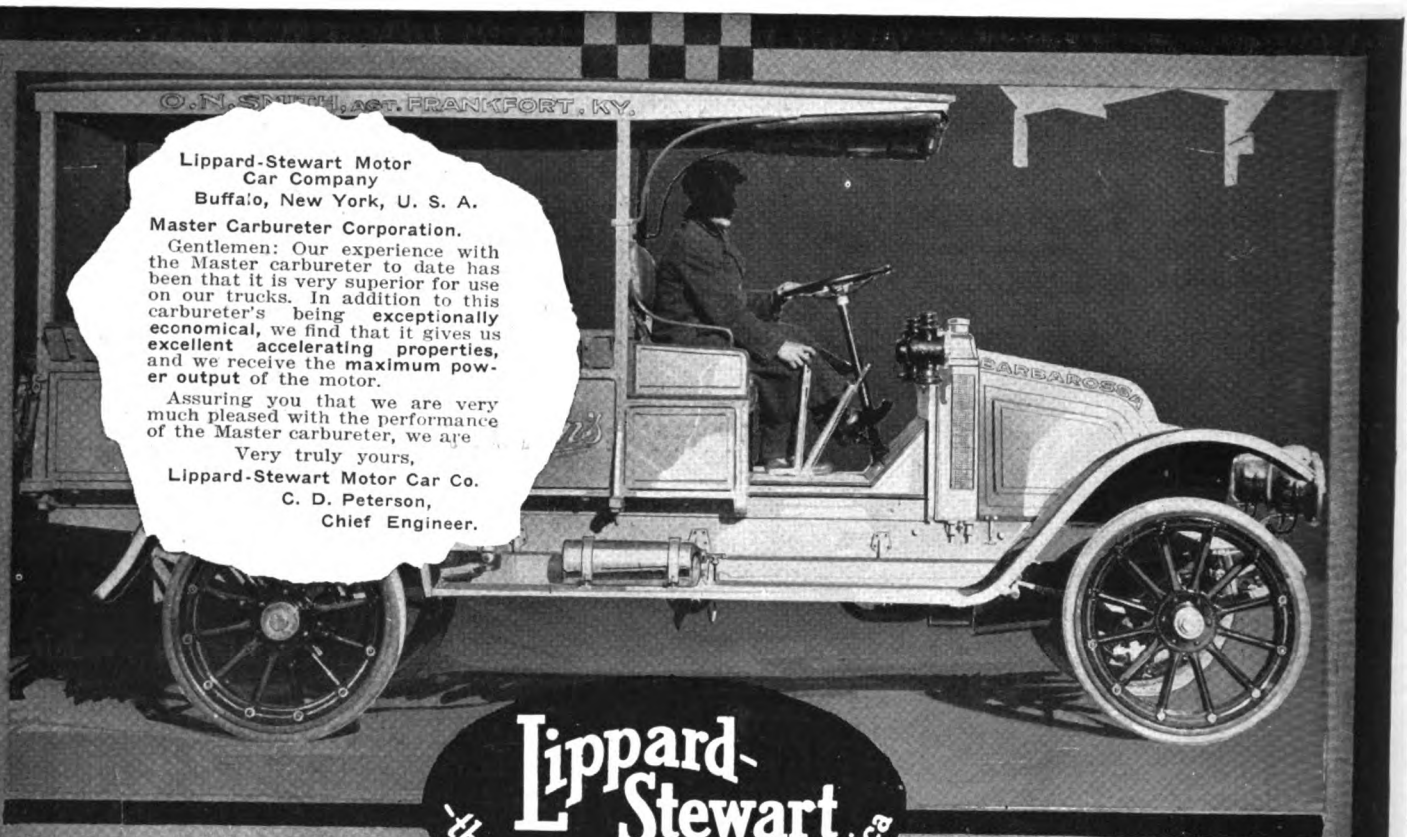
Volume XVI
Number 2

FEBRUARY 15, 1917

Twenty Cents a Cop
Two Dollars a Yea



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Lippard-Stewart Motor
Car Company
Buffalo, New York, U. S. A.

Master Carbureter Corporation.

Gentlemen: Our experience with the Master carbureter to date has been that it is very superior for use on our trucks. In addition to this carbureter's being **exceptionally economical**, we find that it gives us **excellent accelerating properties**, and we receive the **maximum power output** of the motor.

Assuring you that we are very much pleased with the performance of the Master carbureter, we are

Very truly yours,
Lippard-Stewart Motor Car Co.
C. D. Peterson,
Chief Engineer.

Lippard-Stewart
—the Best Motor Truck in America

The Advanta...

Whether it is for ... equal to the ex... power plus.

Because of ... models wil... turer or me...

That's one a...

Because of it... service in ever...

That's anothe...

Because it is a... of rugged materia... last any other truck... is expected by the pur...

That is why it is—T...

If you are a truck dea...

Now

Come Equipped with the Wonderful

MASTER CARBURETER

No matter what make or size of motor truck **you** build, own or drive, this perfected carbureter, with its steering post control, will give you **More Power and Greater Mileage.** We guarantee it. Stop doubting. Prove our claims at our risk. Test this different kind of Carbureter that has

No Adjustments

and yet saves one-third the fuel by operating on 14 jets instead of 1, 2 or 3.

Try the MASTER carbureter on your own truck and prove, if you can, that it will not do on your truck what it is doing on thousands of others of every make. Already adopted as standard equipment by 23 leading manufacturers.

Send a postal for the new MASTER catalog and free particulars. Do it now.

Master Carbureter Corporation
1302-A West Fort St., Detroit, Mich.

Pacific Coast Branch
931 So. Los Angeles St.
Los Angeles, Calif.

...he best to own.

LIPPARD-STEW... COMPANY

½-TON, ¾-TON, 1-... 2-Ton Trucks

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Trucks Lift Freight Embargo

The COMMERCIAL VEHICLE

Volume XVI
Number 3

MARCH 1, 1917

Twenty Cents a Copy
Two Dollars a Year

PIERCE

PIERCE GOVERNOR

ONCE A PIERCE USER—ALWAYS A PIERCE USER

The Lippard-Stewart Motor Car Co. has used PIERCE GOVERNORS as standard equipment on their trucks for four years. Lippard-Stewart Trucks are good trucks, and the manufacturers will not consider using cheap or inferior governors. Trucks equipped with PIERCE GOVERNORS are conspicuous for the few repairs they require, and general low cost of maintenance.

You'll find PIERCE GOVERNORS on all the best trucks.

PIERCE GOVERNOR COMPANY

World's Largest Governor Builders

ANDERSON INDIANA

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Motor Transfer Company

8901-8915 BALTIMORE AVENUE

Motor Truck Service

South Chicago, Ill., January 31, 1917.

Master Carbureter Corporation,
Detroit, Michigan.

Gentlemen:—

Please enter my order for twenty more Master Carbureters, sizes as per specifications given your Mr. Walton.

The five which we have had on test for several months have shown great results according to the daily records of each truck. The Master has saved over former equipment from 16 to 25% of gasoline consumed.

The Master has **a system all its own** of generating gas and getting **maximum power out of low grade gasoline.**

This additional power is gratifying and you are assured of success with such an efficient, foolproof carbureter.

Yours truly,

MOTOR TRANSFER COMPANY,

By W. J. DAVIDSON, Manager.



More Proof!

The Master Carbureter is not merely a better carbureter—it is *different*—it has, as this letter states, a *"system all its own."* Grasp the principle of that system and you will immediately see why the Master is replacing other carbureters on all makes and sizes of trucks—everywhere—why twenty-three leading truck manufacturers have adopted the Master as standard equipment.

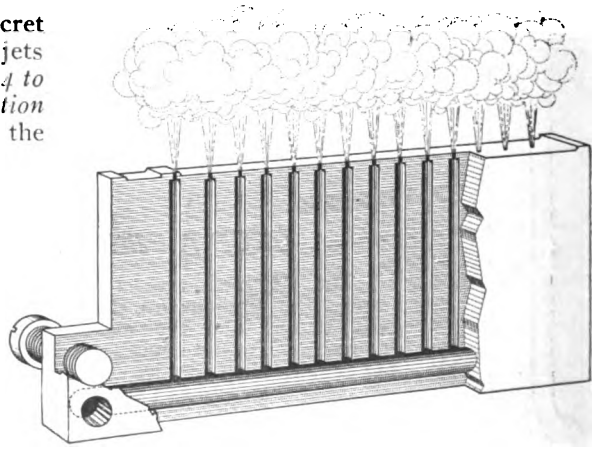
Why not let us *prove*—or fail to prove—that the Master Carbureter will deliver *25 to 40% More Mileage and 30% More Power* on *your* trucks? No obligations—write us today.

MASTER CARBURETER

Costs a Little More—Of Course!

But is the cheapest of all carbureters because it saves its cost many times each year.

Note the *multiple-feed* system of the MASTER—it is the secret of its superiority. Other carbureters feed the gas from 1 to 3 jets in a *liquid stream.* The MASTER delivers the gas through *14 to 21 jets*—in a *thoroughly vaporized mist. Complete vaporization* means *perfect mixture* which gives *perfect combustion* and the *maximum of power out of every bit of gas—with no waste.*



No Adjustments

The Master frees the driver from the greatest of all carbureter troubles—adjustments under the hood. Winter or Summer—in all weathers—under all temperatures—for all grades of fuel—the Master is instantly controlled from the *Steering Post Lever.* This *graduated* operation of the air-damper gives wonderful *flexibility.* For quick pick-up—for sudden power—for instant get-away with a cold motor, the MASTER is absolutely unique.

MAIL COUPON—Let us send you the facts about the MASTER CARBURETER—let us explain its operation. Simply mail coupon for new catalog and interesting booklet on "Carbureters and Carburetion."

Master Carbureter Corp.
1303 W. Fort St.,
Detroit, Mich.

Without any obligation on my part you may send me free and postpaid, a copy of the new Master catalog and "Carbureters and Carburetion."

Name .....

Address .....

.....

MASTER CARBURETER CORPORATION

1303 West Fort St. **Detroit, Mich.**

Pacific Coast Branch:

922-24 S. Los Angeles St., Los Angeles, California

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The Commercial Vehicle

Volume XVI
Number 4

MARCH 15, 1917

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Two Dollars a Year



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The Carbureter with *No Adjustments*

The wonderful, unique Steering Post Control gives you complete mastery of your mixture at all times—*without ever making any adjustments.* From his seat the driver need only touch the steering post lever to accommodate instantly any change in weather, atmosphere or temperature. There are No Adjustments—summer and winter, under *all* conditions, the Master Carbureter delivers uniform, dependable, efficient performance. For quick starting with a cold motor, for flexibility, for range of power, the Master is unsurpassed.

We are ready to prove every claim we make for the Master, and more. Why not let us give a demonstration on your trucks, without expense to you?

SERVICE MOTOR TRUCK CO.
MANUFACTURERS OF
Service MOTOR TRUCKS

WABASH, INDIANA Feb. 24, 1917.

Master Carbureter Corporation:

We are handing you herewith shipping specifications for Master Carbureters to be used as standard equipment on SERVICE motor trucks during this coming year.

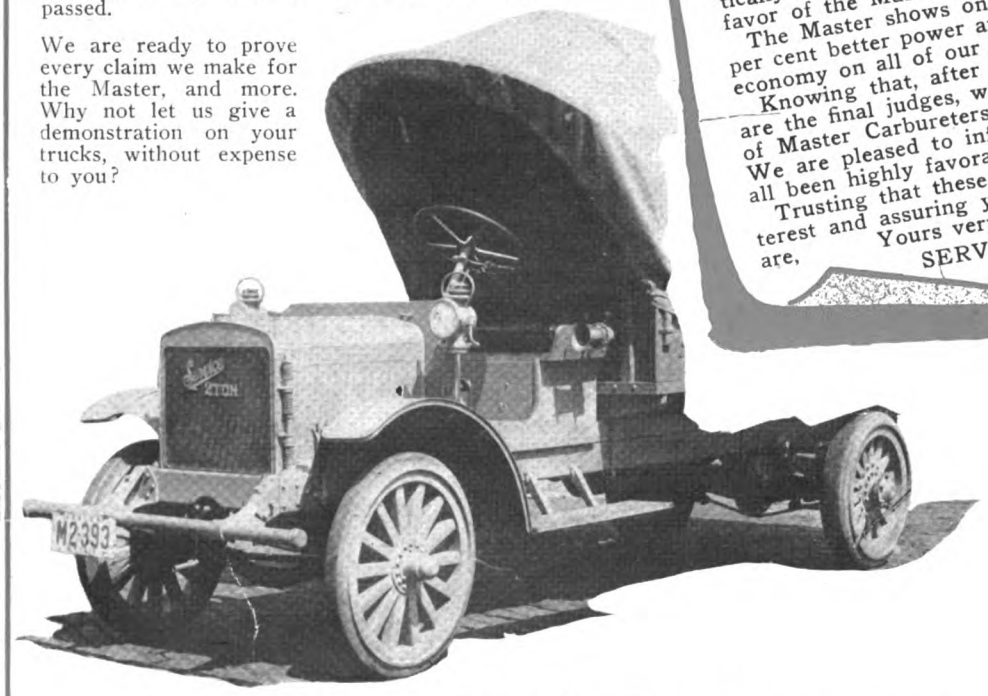
You will no doubt be pleased to learn that, not being satisfied with the exhaustive tests that we had already made, we have recently checked over all tests, as made in competition with all other well-known carbureters and the results are practically the same as formerly, being decidedly in favor of the Master.

The Master shows on an average about fifteen per cent better power and twenty per cent better economy on all of our motors.

Knowing that, after all, the owner and dealer are the final judges, we sent out a great number of Master Carbureters for test in everyday use. We are pleased to inform you the reports have all been highly favorable.

Trusting that these further tests will be of interest and assuring you of our co-operation, we are, Yours very truly,

SERVICE MOTOR TRUCK CO.



Now Standard Equipment on Service Trucks

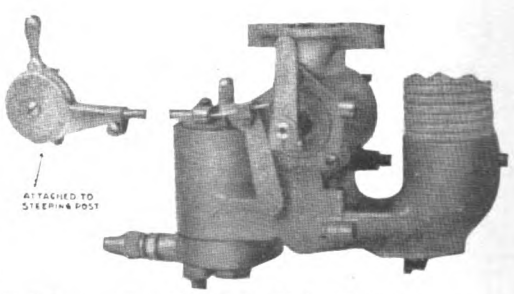
MASTER CARBURETER

25 to 40% More Mileage—30% More Power

The Master Carbureter is being adopted by more and more truck manufacturers and truck owners—because it is **proving** conclusively its superiority—in exhaustive, **competitive** tests. No other carbureter has the advanced, perfected principle of operation of the Master—the many-jet gas feed that gives absolute vaporization of the fuel. Each of the 14 to 21 gas jets occupies a different position in the path of the inrushing air, giving a thoroughly saturated mixture which attains the highest degree of combustibility. Every ounce of power is derived from every drop of gasoline.

Do you know how much power you are losing with your present system of vaporization? If the Master fails to **prove** that the **waste** is 25 to 40% on your trucks, the demonstration will not cost you a cent.

Try the Master **at our risk.** Let us show you how you can **increase the Power of your trucks 30%** and at the same time **cut the Cost of Operation 25 to 40%.**



Master Carbureter Corp.
1303-A W. Fort St.
Detroit, Mich.

Without any obligation on my part you may send me free and postpaid, "Carbureters and Carburetion" and your new catalog.

Name .....

Address .....

City..... State.....

Mail Coupon For FREE booklet, "Carbureters and Carburetion," and new Master Catalog

MASTER CARBURETER CORPORATION
1303-A W. FORT STREET, DETROIT, MICH.
Pacific Coast Branch, 922 S. Los Angeles St., Los Angeles, Cal.

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Better Truck Maintenance—*Pages 10 and 11*

1917

The COMMERCIAL VEHICLE

Volume XVI
Number 5

APRIL 1, 1917

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PIERCE GOVERNOR

F-W-D Truck

Dependable Trucks Require Dependable Governors

A few truck manufacturers, in order to slightly reduce cost of production, do not provide any means for automatically controlling the speed. Others use any makeshift that can be called a governor, regardless of its efficiency, if the price is low.

However, the Four Wheel Drive Auto Co., of Clintonville, Wis., belongs to the big majority of manufacturers who are unwilling to leave their trucks' good name at the mercy of careless and reckless drivers. Along with other high-grade accessories, Pierce Governors have been standard equipment on F-W-D Trucks for over three years.

More than ever, manufacturers of dependable trucks are equipping their product with efficient governors. You'll find a Pierce on practically all of the prominent trucks.

PIERCE GOVERNOR COMPANY

World's Largest Governor Builders

NEW YORK
Earle & Boggs
1790 Broadway

ANDERSON, INDIANA, U. S. A.

CHICAGO
Peterson & Greenwood
122 S. Michigan Ave.

PIERCE GOVERNOR

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FIVE Quarts in Every Gallon of Fuel

MASTER
No Adjustments
Carbureter

If Your Truck is MASTER Equipped

A Master Carbureter extracts from every four quarts of fuel all the Power and Mileage that ordinary carbureters get from five quarts. Letters from hundreds of owners testify to even greater savings. But whether you find that on your truck the Master delivers ¼ more mileage or 30% more power—it all means the same thing, **Greater Economy.**

Gasoline has become precious. What are you doing to cut operating costs? Whether you are a truck owner or a truck manufacturer you have no more vital problem to contend with today—for there will be fewer truck owners and hence fewer truck manufacturers unless operating costs can be cut. **The Master does it.**

A better tire, if you find it, may save you $20 a year. A better carbureter—the Master—will save you hundreds.

Truck Efficiency

No part of a truck is so destructive of efficiency as a "cranky" carbureter that must be re-adjusted for every change of temperature—that must be coaxed—and that invites an unskilled driver to tamper with it.

The old-fashioned carbureter is a constant source of trouble and annoyance.

On the Master there are **No Adjustments** to serve any occasion to raise the hood. Under all conditions it delivers perfect carbureting mixtures from rich to lean or medium to meet the requirements of the moment. Your finger on the unique Master steering post lever changes your mixture instantly from rich to lean or medium to meet the requirements of the moment. This steering post control operates the air damper, opening or closing it to admit air in any quantity or proportion desired. For quick starting with a cold motor and for rapid acceleration the Master positively has no equal.

14 to 21 Jets Instead of 1 to 3. Note the illustration of the Master's multiple-jet gasoline feed compared to the ordinary type of single nozzle feed. It is the secret of the wonderful mileage and power of the Master. The gasoline is thoroughly vaporized, broken up into the finest particles. This gives a mixture that burns the highest degree of combustibility—that delivers the maximum power output from your motor.

We dare to make big claims for the Master Carbureter because its superiority is based on scientific fact. We are ready to prove our assertions on your trucks without one cent of expense to you if we fail.

WRITE

for the proof that the Master actually delivers 25 to 40% more mileage—20% more power. Post yourself on this carbureter that is different. Learn why it is replacing other carbureters of every other make on thousands of trucks in all parts of the country. Write us today.

MASTER CARBURETER CORPORATION
1304 W. Fort St., Detroit, Mich.

Pacific Coast Branch
922 S. Los Angeles St., Los Angeles, Cal.

Master Carbureter Corporation
1304 W. Fort St., Detroit, Mich.

You may send me your new Master Catalog with free booklet, "Carbureters and Carburetion."

Name .....

Address .....

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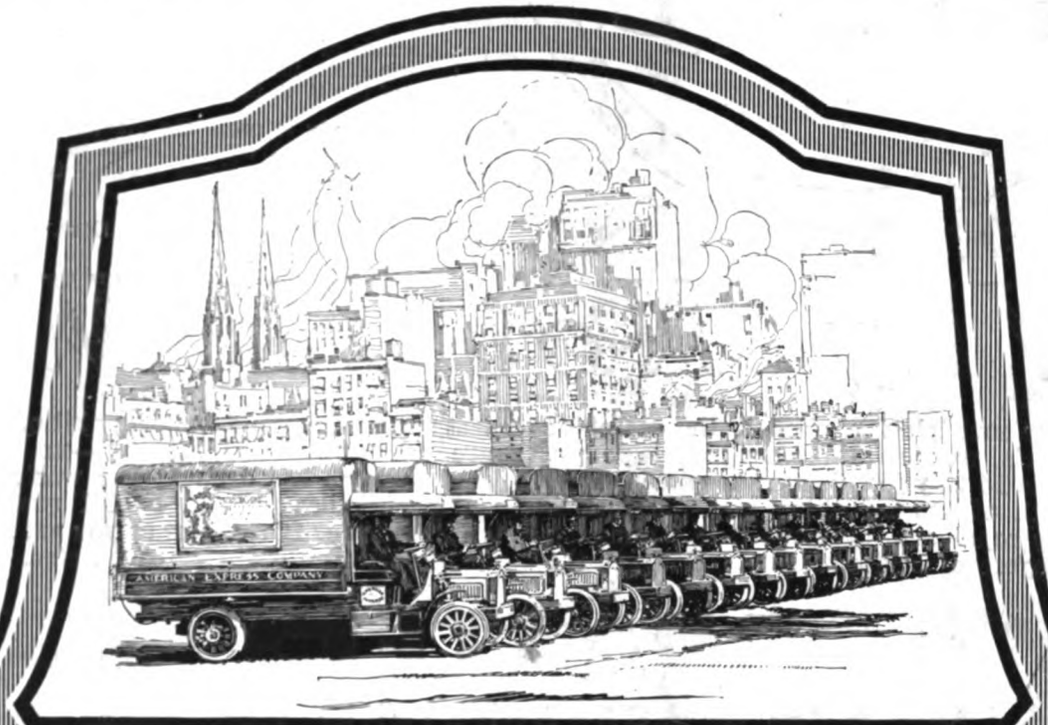
APR 19 1917

The Commercial Vehicle

Volume XVI
Number 6

APRIL 15, 1917

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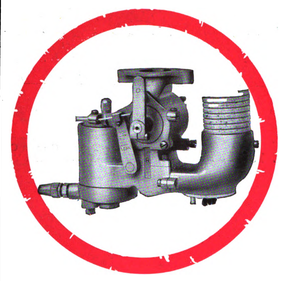


Selling transportation on a world-wide scale, the American Express Company buys hauling equipment on its own records of economy and earning power. Its recent purchase of 131 Packard trucks—bringing its Packard fleet up to 581 units—is significant because it sums up six years' experience with Packards in many cities. Silent, chainless Packards are built in seven sizes to include the cheapest truck in the long run for every service. Ask the man who owns one.

Prices at Detroit—1-ton $2325, 1½-ton $2650, 2-ton $3000, 3-ton $3600, 4-ton $4025, 5-ton $4550, 6-ton $4800

Packard TRUCKS

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When?

The Master Carbureter is in the second year of its existence—yet it is more widely talked about than other carbureters that have been on the market for many years. Why? Because its sensational performances compel the attention of everyone interested in motor trucks—in increasing their efficiency—in cutting the cost of operation.

The Master Carbureter is the FINAL Carbureter. It means the elimination of the old "carbureter troubles," it means *Greater Economy* and *More Power*. The Master has already *proved* its superiority to 23 leading truck manufacturers and to thousands of truck owners, to Fire Departments in leading cities, including New York City, and to carriers of the U. S. Mail.

We are ready to *prove* the Master to you—entirely at our expense. We guarantee 25 to 40% More Mileage and 30% More Power on *your* trucks. Are you ready to be shown?

Just drop us a line—no obligations.

Why Not NOW?

The unique multiple fuel feed is the secret of the Master's wonderful *economy* and *power*. Each of the 14 tiny jets delivers a gaseous mist in the path of the inrushing air—the fuel is *thoroughly vaporized*—every particle attains the highest degree of combustibility. You get the last ounce of power from every bit of gas. There are no "unexploded centers"—no unused gas shot through the exhaust—no waste. You get as much mileage from FOUR quarts of fuel with a Master Carbureter as you get from FIVE quarts with an ordinary carbureter.

MASTER CARBURETER

The Carbureter With *No Adjustments*

The Master Carbureter frees the driver from the greatest of all carbureter troubles—adjustments under the hood. There are NO Adjustments on the Master. All grades of fuel, all weathers, all altitudes and all climates are perfectly and instantly accommodated by the Master's wonderful Steering Post Control. From the driver's seat the mixture can be enriched or rarefied at will to meet any condition. For quick starting, for rapid acceleration, for range of power and flexibility the Master Carbureter has no equal.

Post yourself on this carbureter that is different—write for the facts today. No obligation.

Mail Coupon For FREE booklet, "Carbureters and Carburetion," and new Master Catalog

Whether you are a manufacturer, owner or driver of motor trucks, send your name at once for free copy of valuable new book. It explains the scientific principle of carburetion, the causes of carbureter troubles, and also shows why the Master Carbureter accomplishes such marvelous results. Send the coupon NOW—or a postal to

Master Carbureter Corporation
1304-A W. Fort St.,
Detroit, Mich.

You may send me your new Master Catalog with free booklet, "Carbureters and Carburetion."

Name .....

Address .....

.....

MASTER CARBURETER CORPORATION

1304-A W. FORT STREET, DETROIT, MICH.

Pacific Coast Branch, 922 S. Los Angeles St., Los Angeles, Cal.

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The Commercial Vehicle

Volume XVI
Number 7

MAY 1, 1917

Twenty Cents a Copy
Two Dollars a Year

PIERCE GOVERNOR



Bethlehem Trucks Will Be Pierce Equipped

The big plant of the Bethlehem Motors Corporation at Allentown, Pa., will turn out over 5000 high grade motor trucks during 1917, and each truck will be equipped with a Pierce Governor.

Don't imagine that the officers and engineers of this company decided upon the equipment for their trucks until convinced, by careful investigation and by competitive tests, that each and every accessory selected was the most efficient for their use.

There were several reasons why Pierce Governors were adopted as standard on Bethlehem Trucks. For these same reasons Pierce Governors are being used by 58 other prominent truck manufacturers.

How about your trucks?

The Pierce Governor Company

World's Largest Governor Builders

Anderson, Indiana, U. S. A.

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FREE



To Drivers, Owners and Manufacturers

Send the coupon below for a copy of this remarkable new book. At last! The whole mystery of carburetion and carbureters has been reduced to simple A-B-C terms that any layman can readily understand. No other man in America has a better knowledge of carbureters and carburetion than Raymond M. Anderson. This well known carburetion engineer, in this wonderful new book, has given to the automobile trade the first simple, clear, practical explanation of the most vital element in motor truck operation—fuel consumption.

Send Coupon Below

A REMARKABLE BOOK

No matter how much you have studied or how many books and articles you have read on the subject of carbureters, their operation and adjustment, their perfections or imperfections, your education on this subject is not complete until you have read Mr. Anderson's book. Never was information on this subject so valuable as now when the price of gasoline is mounting higher and higher. Tear out and mail the coupon below. If your request is received before our supply is exhausted we will be glad to send you a copy of this amazing book absolutely free.

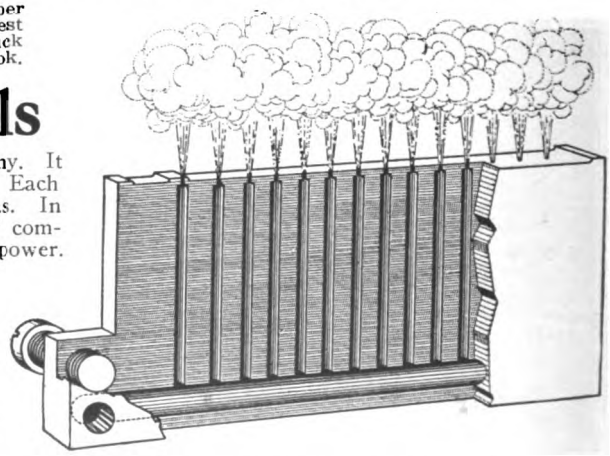
Drivers! Every driver knows that the carbureter is the seat and source of nine-tenths of all engine trouble. You do not know your car until you know your carbureter inside out. What to do and how to do it when it stalls or "eats its head off." Make your services worth more money to your employer by becoming absolutely master of your carbureter as you are master of your steering wheel. Avoid expensive, disastrous lay-ups on the road.

Owners! Give to this question of the carbureter and its fuel consumption a little of the study you give to tire mileage. This book will save you the price of a whole set of tires every few months.

Truck Builders! You can make "the cost per mile" the biggest, strongest selling feature of your truck with the aid of this new book.

Cut Your Fuel Bills

Note the illustration—it is the secret of gasoline economy. It shows the 14-jet fuel feed of the Master Carbureter. Each jet delivers a fine mist of thoroughly vaporized gas. In this way the fuel reaches the highest degree of combustibility—every particle is transformed into power. There are no "unexploded centers"—no waste. Contrast this advanced system of vaporization with the ordinary 1 to 3-jet stream-like spray. The difference means 25 to 40% more mileage—30% more power. Let us tell you more about the Master Carbureter—the carbureter with NO ADJUSTMENTS—the FINAL carbureter.



Master Carbureter Corporation, 1305 W. Fort St. Detroit, Mich.

You may send me, without obligation on my part, Mr. Anderson's article **"Carburetion and Carbureters Explained"** and description of the Master Carbureter.

Name .....

Address .....

FREE COUPON

MASTER CARBURETER CORPORATION

Pacific Coast Branch: 922 S. Los Angeles St., Los Angeles, Cal. — 1305 W. Fort St., Detroit, Mich.

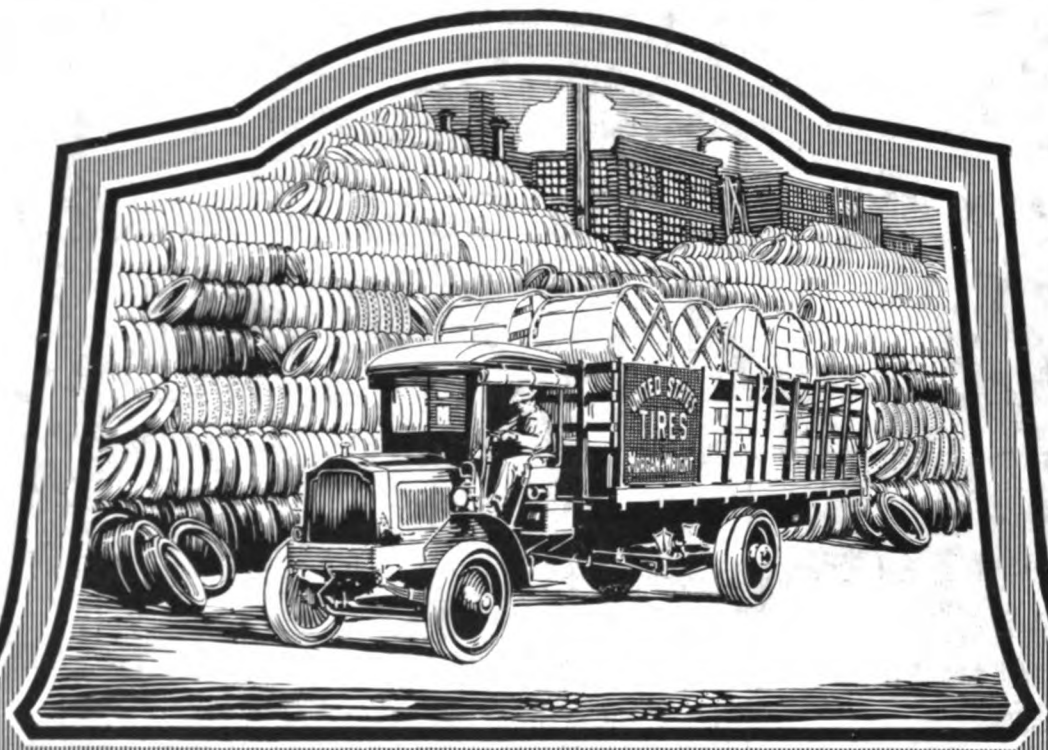
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The COMMERCIAL VEHICLE

Volume XVI
Number 8

MAY 15, 1917

Twenty Cents a Copy
Two Dollars a Year



Heavy hauling cheap! The new series, silent, chainless Packards in five and six-ton units are now fixing new standards of economy and capacity in the heavy duty field. Like the five other sizes of Packards their four-speed transmissions insure long life and low fuel consumption under all service conditions, with terrific pulling power when roads are heavy or starts are hard. Built entire by the Packard Motor Car Company, Detroit. *Ask the man who owns one.*

Packard TRUCKS

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Los Angeles Sunday Times.

Cutting Down the Gas Bill

Less than one month ago a fleet of eight Chase three-cylinder trucks operated by the California Central Creameries Company over all kinds of roads was averaging between seven and eight miles to the gallon of gasoline. Today this same fleet is operated over the same territory and the mileage has been raised to twelve miles. "We had one of our old Chases equipped with a Master Carbureter on trial and the result was sufficient," said Frank Nazro, the company's local manager. "With this saving in gas but a short while will be required in which to pay for the Masters." One Chase which was purchased more than five years ago and which less than one year ago was turned in, in return for new equipment, has again been bought by the Creameries Company and is now numbered with the fleet and doing yeoman service equipped with a Master. "What we considered as almost junk has been given a new and long lease on life with the Master," said Nazro. "In the Chase the lubricating oil and the gasoline is fed to the engine from the same tank. The multiple spray of the Master breaks up this mixture into so many small jets that the maximum of energy is secured at the minimum of cost. Since the installation of the Master there has been a decrease in the amount of oil used."

Owner of Eight Trucks Gets

71% More Mileage

With the MASTER Carbureter

California Central Creameries.

Los Angeles, Cal.,
April 3, 1917.

Master Carbureter Corporation,

Gentlemen:—For several months this concern was dissatisfied with the performance of our trucks engaged in the wholesale distribution of Golden State butter. This fleet consisted of one ton trucks. Each generally started out under a ton and a half load and we were getting only about seven miles per gallon of gasoline. As you will recollect, at your suggestion, we installed Master Carbureters, whereupon our mileage jumped to twelve miles per gallon of gasoline.

Master Carbureters assist materially in the economical distribution of Golden State butter; the results have been satisfactory and the service all that could be desired.

Sincerely yours,
CALIFORNIA CENTRAL CREAMERIES.
Frank Nazro, Manager.

That is the amazing economy actually effected by the California Central Creameries when their trucks were equipped with Master Carbureters. Each of their eight trucks got FIVE MORE MILES out of every gallon of gasoline with the Master Carbureter!

That is ECONOMY that means something! Not the results of special tests made under ideal conditions—but the steady, day-in-and-day-out performance of this wonderful carbureter—on a whole fleet of trucks. Figure the saving in dollars and cents to this fleet owner—approximately $1,800 a year! The initial cost of the Master Carbureter is quickly recovered—the saving in gasoline continues year after year, as long as the truck is in operation.

What the Master has done on the trucks of the California Central Creameries is only what it has done on hundreds of other trucks of every size and make. Never was this question of GAS ECONOMY so important to truck manufacturers and owners as TODAY. We are ready to prove the Master on *your* trucks. Drop us a line—no obligation.

The Carbureter With No Adjustments!

The Master absolutely eliminates all costly road delays. It is trouble-proof—it has no springs, cams or dashpots to get out of order—and there are NO ADJUSTMENTS! Every condition of road or weather, altitude or temperature, is instantly accommodated by the wonderful, exclusive Steering Post Control.

14 Jets Instead of 3—Understand the principle of the Master Carbureter and you will see the secret of its amazing economy. Examine the unique 14 jet fuel feed—contrast it to the ordinary 1 to 3 jet feed. The difference is at least 25 to 40% more mileage—30% more power than you are getting with your present carbureter, no matter what make. We *guarantee* it—and we will be glad to prove it on your trucks, at no expense to you if we fail. Isn't it worth proving? Write us today. Mail coupon for valuable article on "Carburetion and Carbureters Explained" and description of the Master Carbureter.

Master Carbureter Corporation,
1305-A W. Fort St.
Detroit, Mich.

Gentlemen: You may send me "Carburetion and Carbureters Explained," and new Master Catalog.

Name .....

Address .....

.....

MASTER CARBURETER CORPORATION

Pacific Coast Branch:
922 S. Los Angeles St., Los Angeles, Cal. 1305-A W. Fort St., Detroit, Mich.

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The COMMERCIAL VEHICLE

Volume XVI
Number 9

JUNE 1, 1917

Twenty Cents a Copy
Two Dollars a Year

GOVERNOR

Something To Think About

Diamond T Trucks are famous for the high quality of material used in their construction, and for the dependability of their operation. Pierce Governors will be standard equipment on Diamond T Trucks for 1917. No other governor will meet their requirements.

Pierce Governors are at present being used by 59 prominent truck manufacturers, among whom are Studebaker, Cadillac, Commerce, Bethlehem, Service, Denneen, Kissel, Four-Wheel-Drive, Signal, Velie, Lippard Stewart, Maccar, etc.

During the first three months of 1917, orders were booked for approximately 3000 more Pierce Governors than were sold during the entire year of 1916.

Form your own conclusions.

The Pierce Governor Company
World's Largest Governor Builders
Anderson, Indiana, U. S. A.

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Another Truck Builder Testifies to the Wonderful

POWER AND ECONOMY

MASTER TRUCKS, INC.
CHICAGO, U. S. A.

Master Carbureter Corporation,
Detroit, Mich.

Gentlemen:

Your recent shipment of carbureters received O. K.

Would say that Master Carbureters are meeting every expectation. The writer, having had so much experience with the truck business and also with Master carbureters, was sure this was one unit that we wanted in connection with our quality trucks even though they do cost more money. The installations are easily made with Master Carbureters and the fact that they have No Adjustments makes it possible for our purchaser to get all of the power and all the economy, all of the time. We assure you that the power and economy of the Master is much in excess of any other carbureter that we have ever tried, and we know that it will never be necessary for us to send a man out 4, 5 or 10 miles to adjust carbureters.

MASTER TRUCKS, Inc.
E. GOLDMAN, V. PRES. & GENL. MGR.

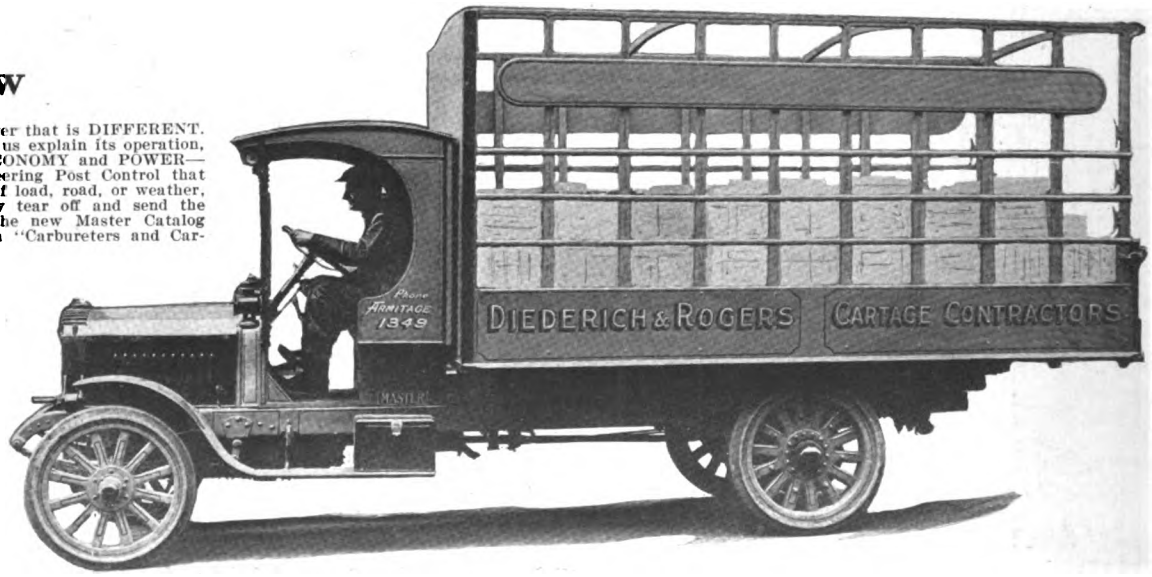
Of the Advanced and Perfected

MASTER CARBURETER

FORTY of the foremost truck builders in the world now use and endorse the Master Carbureter. It is not merely a better carbureter—it is DIFFERENT. Contrast its 14 jet fuel feed operation to the old style 1 to 3 nozzle feed—grasp the principle of that system and you will immediately see why the Master is replacing other carbureters on all makes and sizes of trucks—everywhere. The Master Carbureter has *proven* its superiority to FORTY of the biggest experts in the motor truck industry and to hundreds of truck owners and drivers. Why not let us prove—or fail to prove—that the Master Carbureter will deliver *25 to 40% More Mileage* and 30% More Power on *your* trucks? No obligations—write us today.

Mail Coupon Below

Post yourself on this Carbureter that is DIFFERENT. Let us send you the facts—let us explain its operation, the secret of its wonderful ECONOMY and POWER—let us describe the unique Steering Post Control that accommodates every condition of load, road, or weather, with No Adjustments. Simply tear off and send the coupon. We will mail you the new Master Catalog with an eye-opening article on "Carbureters and Carburetion" free and postpaid.



Master
Carbureter Corp.,
1306 W. Fort St.,
Detroit, Mich.

Without any obligation on my part you may send me free and postpaid, a copy of the new Master catalog and "Carbureters and Carburetion."

Name .....

Address .....

.....

The Carbureter With No Adjustments!

MASTER CARBURETER CORPORATION
1306 W. FORT STREET, DETROIT, MICH.
Los Angeles Branch—922 So. Los Angeles Street, Los Angeles, Calif.

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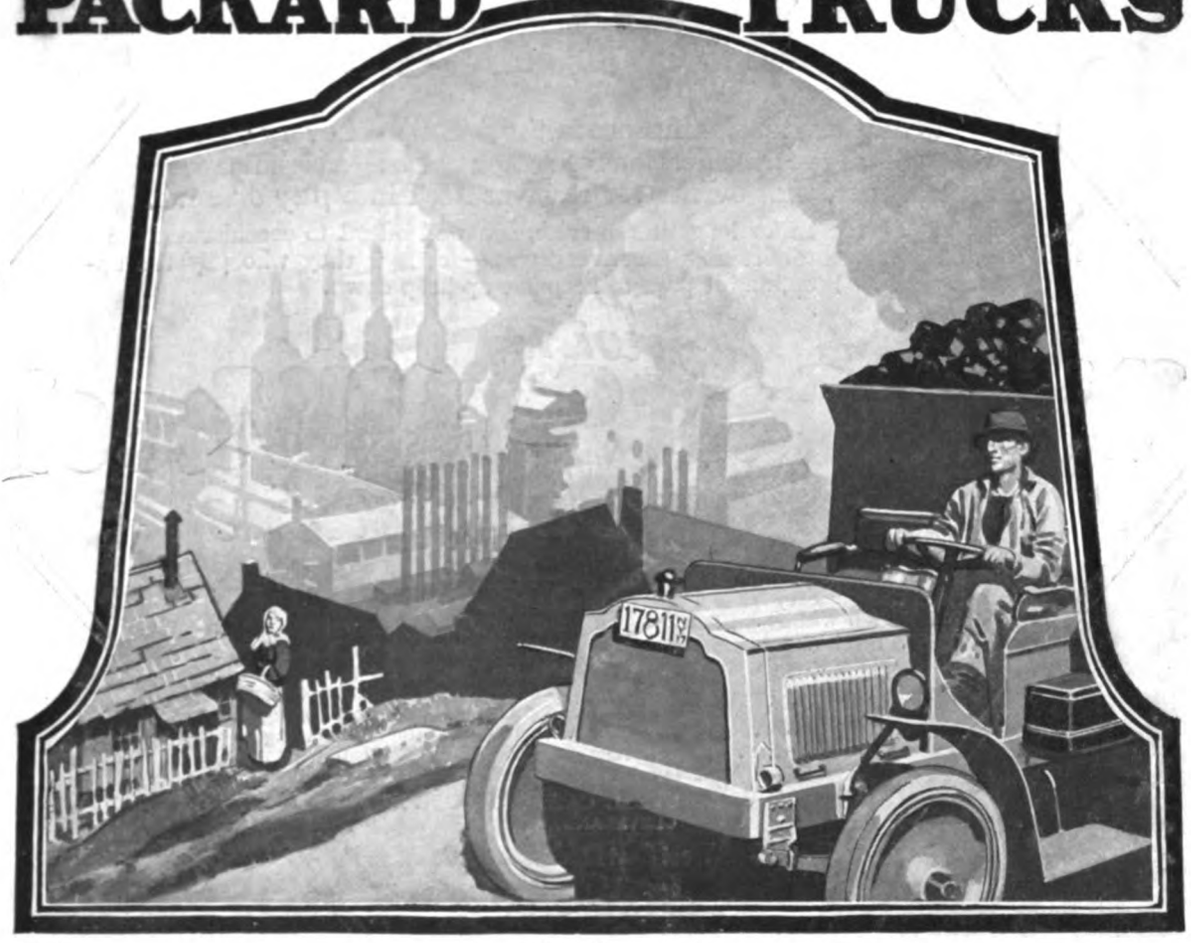
The Commercial Vehicle

Volume XVI
Number 12

JULY 15, 1917

Twenty Cents a Copy
Two Dollars a Year

PACKARD TRUCKS



Now money counts! In buying a truck you must get utmost earning power for every dollar

Not purchase price, but cost per year of service and per ton moved is THE TEST of hauling equipment.

Many Packards, nine-years-young, are still *earning* and *saving* for their owners.

Packard economy is the sum of sound design and Packard-built stamina, reinforced by unfailing service. The four-speed, silent, chainless drive saves fuel—saves wear and tear—saves tires—masters every road.

Seven sizes. Built by Packard Motor Car Co., Detroit. ***Ask the man who owns one.***

Packard

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40,000
Standard Hub
Type in
Daily Use

Patents
Pending

The Owner Pays Less

There is a vital significance in the selection of every part that enters the specifications of motor trucks—a significance for the owner, that eventually resolves itself into ***pay or save.***

Owners, buying trucks for long time service, can well afford to consider not the first cost, but the eventual saving from every part—for it is they who pay the up-keep, and it pays to keep the up-keep down.

with

West's Cast Steel Wheels

on Heavy Duty Trucks

—the motor truck owner has one of his greatest opportunities to save. 25% increase in tire efficiency is the first step on the right side of the ledger, and it is closely followed by dependability and in many cases lighter weight.

WEST'S Steel Wheels are standardized, and regularly used with standardized axles you know. They are the oldest, most reliable and successful. Thousands are in daily use, living up to requirements of all kinds of heavy duty hauling—answering the problem presented to owners through every part of every motor truck, with the gratifying and paying solution — SAVE. On every set of WEST'S Steel Wheels ***satisfaction is guaranteed. Write.***

THE WEST STEEL CASTING COMPANY
CLEVELAND, OHIO

"Watch The West Cast Steel Wheels Go Round"

Patents
Pending

The New Hubless Type
For Pressed-on and
Demountable Tires

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STOP SPEEDING



NO truck can withstand the greatest of all abuses—excessive *speed*. Continuous and economical service is always sacrificed by it. Overspeeding is paid for by the shortened life of the truck.

The work of the Monarch Governor is to make speeding impossible without limiting the power.

MONARCH
Limits the Speed and the Expense
GOVERNOR

BECAUSE it is the only governor designed solely for internal combustion engines, our efforts in developing and perfecting the Monarch Governor have been concentrated upon the exact conditions you have to meet. A test of the Monarch Governor on your truck will show distinctive performance. You'll always find it dependable and uniform in operation. Even a suddenly applied or released load will not permit the engine to yary in speed. The Monarch Governor has no revolving parts—no gears—no shafts. It requires no attention and is so simple and rugged in construction that it will outwear the truck itself. A padlock prevents tampering. Change in maximum speed can only be made by one authorized.



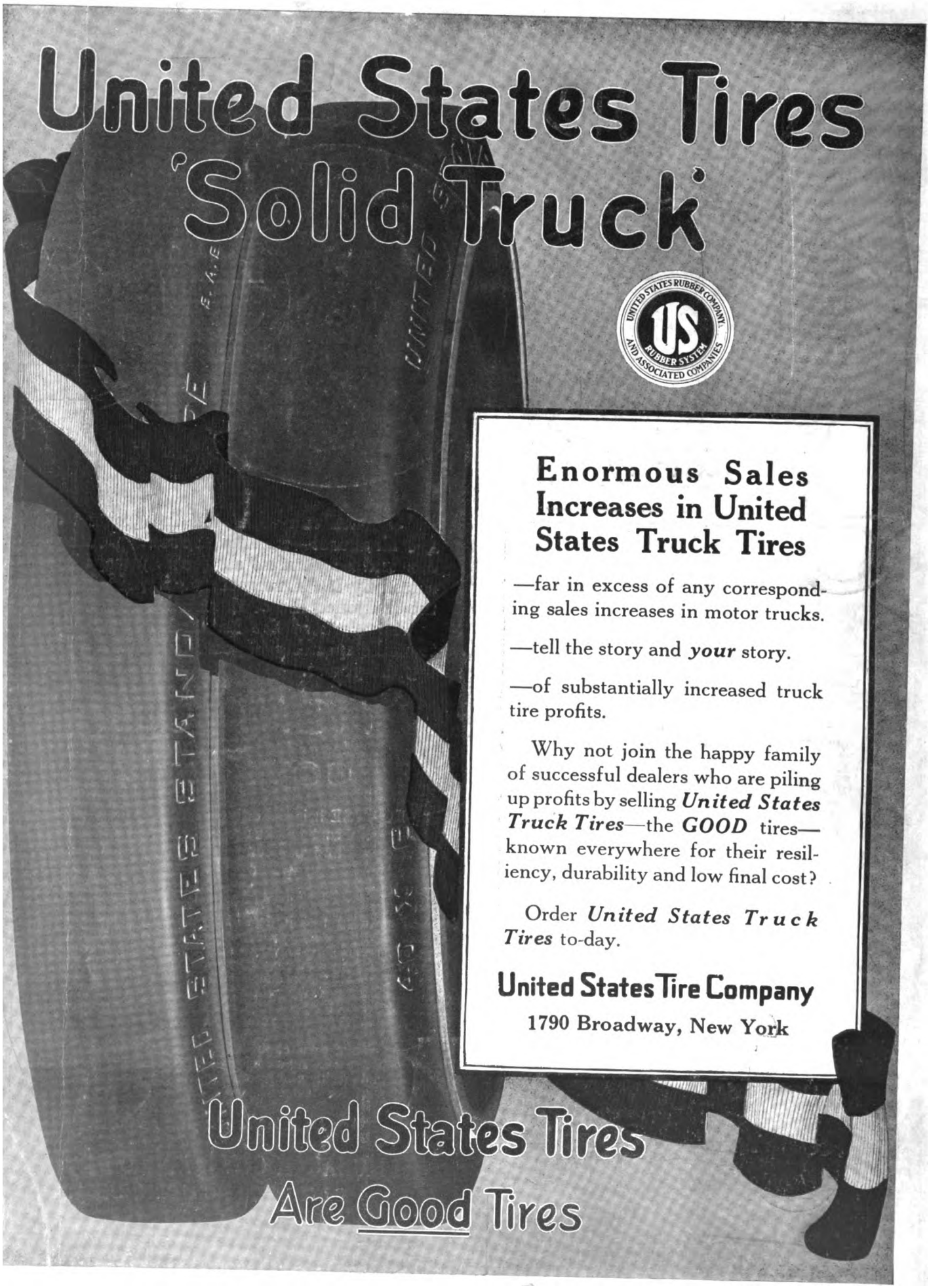
A successful combination—Denby Truck and Monarch Governor. Ask us for information—ask Monarch users for facts.

Your own experimental department can easily prove the superiority of the Monarch Governor; and we'll gladly co-operate in conducting exhaustive tests.

Booklet sent upon request.

MONARCH GOVERNOR COMPANY
DETROIT, MICHIGAN, U.S.A.

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